Malaysia, institutions and the middle-income trap

Challenges in human capital development and income inequality in the manufacturing sector

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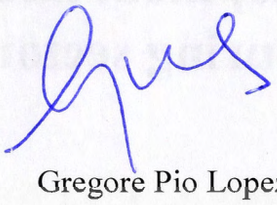

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Abstract

Malaysia's growth performance in recent years has been lacklustre. This research attempts to identify what institutional issues may have contributed to this performance.

The research examines the impact of institutional quality on economic performance generally. The study proceeds at two levels: at the cross-country level and at the sectoral level. The research uses econometric and case study analysis to explain the effects of institutions on economic performance and identify the fundamental causes of less satisfactory economic outcomes. Recommendations for institutional reform then follow.

At the cross-country level, a stochastic frontier model was used to analyse the relationship between institutions and economic efficiency, to rank the economic efficiency of Malaysia in relation to other countries over time, and to explain what the reasons are for changes in economic performance. Economic efficiency is defined here by measuring numerically a best practice frontier and evaluating the performance of countries included in the study (or other economic units) relative to that best practice frontier. The results suggest that overall, and at the middle income level, institutions related to 'Government Effectiveness' have the strongest impact on economic efficiency. Institutions related to 'Control of Corruption' and 'Rule of Law' are important to economic efficiency at the middle income level while institutions related to the 'Rule of Law' matter the most to economic efficiency at the high income level.

Using a case study approach, the thesis investigates the links between human capital development and manufacturing sector output and the determinants of wage inequality in the manufacturing sector. A stochastic frontier model is again used, here to investigate the contribution of the different skills level to manufacturing sector output. The results demonstrate that unskilled labour contributes most significantly manufacturing sector output. Using the 'supply-demand-institutions' framework and implementing it within a modified industry wage equation framework, the determinants

of the wage gap at the industry level in the manufacturing sector were identified. Difference in skill levels are found to have the biggest impact on increasing the wage gap in Malaysia's manufacturing sector.

The analysis suggests three key reasons for the weak human capital development in Malaysia's manufacturing sector. First, Malaysia's education and training institutions have failed to produce skilled labour in sufficient numbers and quality. Second, skills development through training, retraining and up-skilling in the manufacturing sector has not produced the required human capital with the appropriate skills. Private sector linkages as well as the public-private sector partnerships that are necessary for effective training and development are at much lower and unsatisfactory levels in Malaysia's manufacturing sector compared to the successful East Asian economies. Third, labour policies in the manufacturing sector provide incentives for firms to rely on unskilled or semi-skilled labour rather than use high skilled labour. The unlimited supply of unskilled labour and weak human capital formation in the manufacturing sector (that Malaysian policy and institutional settings allow) in turn leads to increasing wage inequality. The government's response to human capital development and income inequality is primarily race-based, and has failed to resolve these issues. This approach is unlikely to be successful in addressing the middle-income trap. A move away from race-based institutions will be necessary to break through the middle income trap.

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Abbreviations and Acronyms

ADB	Asian Development Bank
CGD	Commission for Growth and Development
CIA	Central Intelligence Agency
E&E	Electrical and electronics
EAFC	East Asian Financial Crisis
ELF	Ethno-linguistic fractionalisation
EOI	Export Oriented Industrialisation
EPU	Economic Planning Unit
ETP	Economic Transformation Programme
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GE	Government Effectiveness
GER	Gross enrolment ratio
GLCs	Government Linked Corporations
GNI	Gross National Income
GTP	Government Transformation Programme
HDI	Human Development Index
ICA	Industrial Coordination Act
ILO	International Labour Organisation
IMD	International Institute for Management and Development
ISCO	International Standard Classification of Occupation
ISI	Import Substitution Industrialisation
KAM	Knowledge Assessment Methodology
KEI	Knowledge Economy Index

MASCO	Malaysian Standard Classification of Occupation
MDC	Multimedia Development Corporation
MIGHT	Malaysian Industry-Government Group for High Technology
ML	Maximum Likelihood
MNC	Multinational corporation
MNCs	Multinational Corporations
NDP	National Development Policy
NDTS	National Dual Training System
NEAC	National Economic Advisory Council
NEM	New Economic Model
NEP	New Economic Policy
NICs	Newly Industrialising Countries
NKRA	National Key Result Areas
NVP	National Vision Policy
OECD	Organisation for Economic Cooperation and Development
PICS	Productivity and Investment Climate Survey
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student assessment
PPP	Purchasing power parity
PRC	People's Republic of China
R&D	Research and development
S&T	Science and Technology
SDI	Supply-Demand-Institution
TAI	Technology Advancement Index
TALIS	Teaching and Learning International Survey

TE	Technical Efficiency
TFP	Total Factor Productivity
TIMSS	Trends in International Mathematics and Science
UMNO	United Malays National Organisation
UNESCO	United Nations Economic, Social and Cultural Organisation
WB	World Bank
WDI	World Development Indicators
WEF	World Economic Forum
WGI	Worldwide Governance Indicators
WTO	World Trade Organisation

Chapter 1 Caught in a middle-income trap

> Malaysia is caught in a 'middle-income trap' – caught between low wage producers and highly-skilled innovators and without a viable growth strategy.
>
> NEAC (2010a, p. 14)

Malaysia, a developing economy with historically stellar growth performance, is said to be caught in a middle-income trap. A survey of the indicators of Malaysia's economic fundamentals suggests that Malaysia is markedly different from other high-income economies in human capital development and income inequality. This raises interesting questions about the reasons for this difference. This chapter sets out the background to the question of where Malaysia stands in the ladder of economic development, discussing and defining the middle-income trap and how it relates to the challenges that Malaysia currently faces. The chapter goes on to establish the research questions, the research method employed to answer the research questions, and concludes by outlining the organisation of the arguments in approaching the research questions.

INTRODUCTION

In many ways Malaysia's economic performance since independence from the British in 1957 has been remarkable. In 1993, Malaysia was identified as among eight 'East Asian Miracle' economies that were recording 'spectacular' economic growth (World Bank 1993).[1] Malaysia was also one of 13 countries to have recorded average growth rates of more than 7 per cent per year for 25 years or more between 1967 and 1997 (CGD 2008).[2]

[1] The World Bank (1993) categorised eight Asian economies that had 'miraculous' economic growth rates (real GDP growth of around or above four per cent) from 1960 to 1990 as high performing Asian economies: Japan, the 'Four Tigers' – Hong Kong, the Republic of Korea, Singapore, and Taiwan, Province of China – and the three newly industrialising economies of Indonesia, Malaysia and Thailand.

[2] The 13 economies identified by the Commission on Growth and Development (2008) were Botswana, Brazil, Hong Kong SAR, Peoples' Republic of China (PRC), Indonesia, Japan, Republic of Korea, Malaysia, Malta, Oman, Singapore, Taiwan, Province of China and Thailand.

Since the 1997/98 East Asian Financial Crisis (EAFC), this has changed. Key economic indicators, such as GDP and GDP per capita, are on a downward trend. The average GDP per capita growth rate has dropped from 5.2 per cent for the period 1970-1979 to 2.8 per cent for the period 2000-2009 (Hill et al. 2012). Exports and imports, private investment, gross capital formation and total factor productivity are all on a downward trend. Average labour productivity growth has dropped from 5.5 per cent per annum during the pre-crisis period (1987-1997) to 2.9 per cent per year during the post-crisis period (1998-2007) (NEAC 2010a) while private investment is now 10 per cent of GDP, down from 30 per cent of GDP before the EAFC (World Bank 2009a). Foreign direct investment (FDI) inflows, the main driver of Malaysia's most important export sector – manufacturing – is also on a downward trend.

In 2009, Malaysia's new Prime Minister, Najib Razak, commissioned a study to analyse the reasons for Malaysia's deteriorating economic performance. The outcome was a vision document titled 'The New Economic Model' (NEAC 2010a). The report provided an overview of the challenges that the Malaysian economy was facing. The NEAC argued that Malaysia core challenge was that it was caught in a middle-income trap:[3]

> The economy is caught in a middle income trap – caught between low-wage producers and highly-skilled innovators and caught with a viable high-growth strategy. The policies and strategies used to achieve the current state of development are now inadequate for the next stage of development.
>
> NEAC (2010a, p. 34)

Stated differently, Malaysia's past successful growth strategy, which relied on its comparative advantage of low cost labour and natural resources in attracting foreign direct investment, have since diminished. However, with low human capital and low

[3] The NEAC report main diagnosis follows on from several other studies published by the World Bank such as 'The East Asian Renaissance', (Gill and Kharas, 2007), 'Tigers Economies under Threat' (Yusuf and Nabeshima, 2009) and 'Repositioning for Growth' (Malaysia Economic Monitor, 2009) had preceded the NEAC in identifying this situation.

technological capabilities, Malaysia is unlikely to overcome the middle-income trap without new sources of growth and new growth strategies.

The NEAC recommended several broad reform strategies that Malaysia needed to undertake to 'overcome' the middle-income trap. This New Economic Model would undergird the Prime Minister's reform efforts. The NEAC also identified the constraints that Malaysia faces in its efforts to achieve high-income or developed economy status. The report points to domestic factors such as 'weak investor confidence', 'capability constraints', 'productivity ceilings' and 'institutional degradation' and external factors 'such as a sluggish global economy' caused by the global financial crisis (GFC) and the 'rise of neighbours in the region' as contributing to the declining growth trajectory (NEAC 2010a). The report concludes that without widespread economic reforms, the Malaysian economy will be trapped in its upper middle-income economy equilibrium but that it also runs the risk of spiralling downwards (NEAC 2010a).

THE MIDDLE-INCOME TRAP

The term middle-income trap is now an idea that has wide currency. At its core, the middle-income trap attempts to explain the long term economic stagnation and growth slowdowns of fast growing East Asian economies (Gill and Kharas 2008; Kharas and Kohli 2011) and in particular the newly emerging middle-income economies such as China, India, Thailand and Vietnam (World Bank and DRC 2012; Eichengreen et al. 2011; Kohli and Mukherjee 2011; Phongpaichit and Benyaapikul 2012; Ohno 2009). It has now been retrospectively applied to also explain the performance of Latin American economies in the 1980s (Jankowska et al. 2012).

The middle-income trap narrative appears to be compelling but there is still no consensus about its theoretical underpinnings and/or conclusive empirical evidence. There is also the argument that the middle-income trap – if it is a trap – is caused by political factors, and not economic ones, as the politicians and/or the political system is unable to find the required policy solutions to deliver continued economic growth

(Riedel 2011; Doner 2012).[4] Four critical questions continue to challenge the middle-income trap concept: (1) how much should the economic growth rates fall from trend; (2) for how long should they fall or remain stagnant; (3) at what income levels should this occur, for it to be considered a middle-income trap, and (4) if this concept can be applied retrospectively. These questions continue to be debated as economists' attempt to find a rigorous theory and the supporting empirics to explain this phenomenon.

The middle-income trap concept or term is used to describe the experience of low-income countries[5] that initially compete successfully in international markets by producing labour intensive low costs products often by using technologies developed in advanced economies. These countries experience the gains of 'catching up', with large productivity gains that occur through the reallocation of labour and capital from low productivity agriculture to high productivity manufacturing. As these countries reach middle-income level, the underemployed rural labour force dwindles and wage rise, eroding competitiveness. Productivity growth from sectoral reallocation and technology catch-up are eventually exhausted, while rising wages make labour-intensive exports less competitive internationally. When countries cannot increase productivity through innovation or adaptation in products and processes, they find themselves trapped as they are unable to compete with lower cost producers or technologically superior competitors further up the value chain (Fang 2012; Kharas and Kohli 2011).

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[4] Riedel's (2011) arguments were presented through an unpublished working paper at a seminar at the Crawford School of Public Policy, Australian National University. Riedel puts forward the following proposition, 'If the middle-income trap is associated with a slowdown in long-term growth due to policy, rather than the natural and inevitable consequence of catching-up with high-income countries, as theory predicts; and if growth slowdown is due to policy, does it mean ipso facto that a country is 'trapped' when all that may be needed to raise growth is a change in policy?'. Riedel argues that the answer is no, unless the government does not want to change policy because it has a vested interest in growth-inhibiting policies. In this case the country may be considered to be trapped, but by politics, not policy per se. Riedel goes on to put forward a hypothesis and an empirical illustration to explain why middle-income countries may be especially prone to a political growth trap. Doner (2012) has a similar argument but he specifies the reasons that political regimes are trapped at the middle-income. He notes that successful economic upgrading beyond the middle-income are retarded because political regimes have access to resources, including export revenues, external aid, and migrant/informal labour all of which limits the need to develop local competitiveness.

[5] The World Bank classifies countries by income group using the World Bank Atlas method. The groups are: low income, US$1025 or less; lower middle income, US$1026 - $4,035; upper middle income, US$4,036 - $12,475; and high income, US$12,476 or more.

Garrett (2004) first introduced the term middle-income trap when he observed that for the period 1980 to 2000, increased integration[6] had led to the middle classes within countries and middle-income economies among countries being squeezed.[7] High-income economies had increased their per capita income by 50 per cent in real terms while low-income economies had increased their real per capita income by more than 160 per cent. However, real per capita income for middle-income economies grew by only 20 per cent.

This provided the premise for his argument that, in global markets the only option for middle-income economies to move ahead was either to be competitive in the knowledge economy, which rewards skills, and develops institutions that promote cutting-edge technological innovation, or stay as a low-wage economy, which uses widely available technology to do routine tasks at the lowest possible cost.

The middle-income trap from the economic development perspective involves three inter-related concepts popularised in the 1950s – 'the poverty trap', 'the big push' and 'the take-off' (Easterly 2006). The poverty trap argues that many poor countries were in stagnation due to low economic growth, which leads to low savings and low capital accumulation which fails to keep up with depreciation and population growth (Rostow 1969 and Hayami 1998 cited in Easterly 2006). To enable these poor countries to break out of their poverty trap and achieve take-off or sustained economic growth, a 'big push' is needed. The 'big push' called for large scale externally financed investment which could not spontaneously emerge from the private sector because of market failures (Rosenstien-Rodan 1943 cited in Easterly 2006). When countries experience a growth slowdown and stagnation at the middle-income level, a similar strategy is required to achieve take-off. Except for Hong Kong, all of the successful East Asian economies have adopted measures that have conformed to this prescription since

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[6] Garrett (2004) uses the term globalisation which he did not define. However, he constantly refers to uninhibited trade and capital flows. It can be assumed that Garret refers to trade and financial integration.

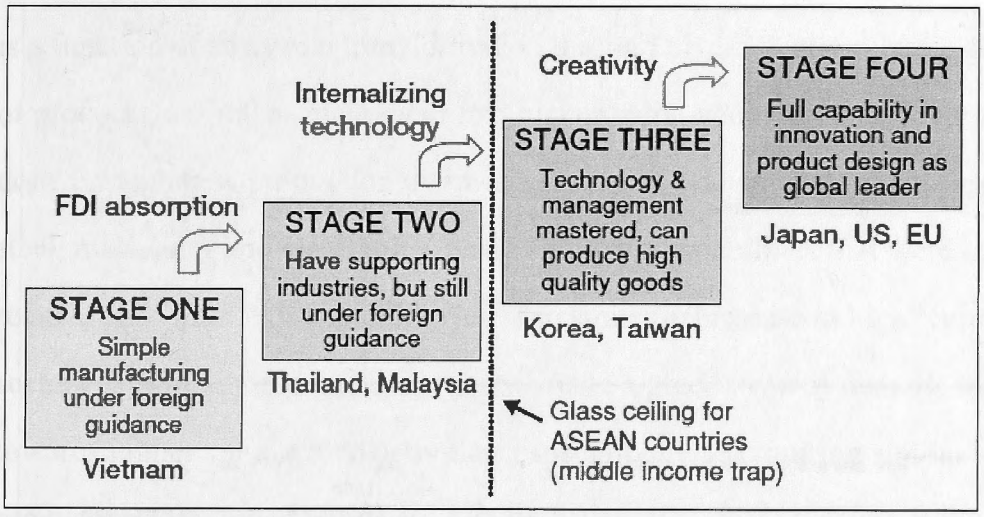
[7] Garrett (2004) observed this by calculating the changes in per capita national income of countries and using the World Bank classification. The top 25 per cent are high income economies and the bottom 30 per cent are low income economies. The remaining 45 per cent are the middle income economies.

the beginning of their industrialisation process (World Bank 1993; Wade 2003). In relation to the middle-income trap, Malaysia's New Economic Model is explicitly premised on such an approach (NEAC 2010a).

Aoki (2011), in analysing the economic development of China, Japan and Korea, identified five phases of economic developments that were common among these three countries. These five phases were the Malthusian phase, where technological progress could not keep pace with population growth; the government-led phase, where the economy overcomes the Malthusian trap through government involvement; the Kuznets phase, where the labour share of industry exceeds the agricultural share; the human-capital-based phase, when high total factor productivity drives economic growth; and the post-demographic phase where the low fertility rates and economic shrinkage of the economically active population has a negative impact on GDP per capita. While the development phases were common, there were marked differences in the onset, duration and institutional forms of these economic phases across the three countries. Aoki (2011) provides an institutional analysis to explain these divergences in the economic development phases. He also postulates that institutional reform will be critical in managing the middle-income trap.

Industrial structure analysis has also been used to explain the middle-income trap. Using a 'stages of industrialisation approach' and focusing on the manufacturing sector among East Asian economies, Ohno (2009) identifies several countries, including Malaysia that are stuck in the middle-income trap, the second stage in Ohno's schema (see Figure 1).

Figure 1 Stages of catching-up industrialisation and the middle-income trap



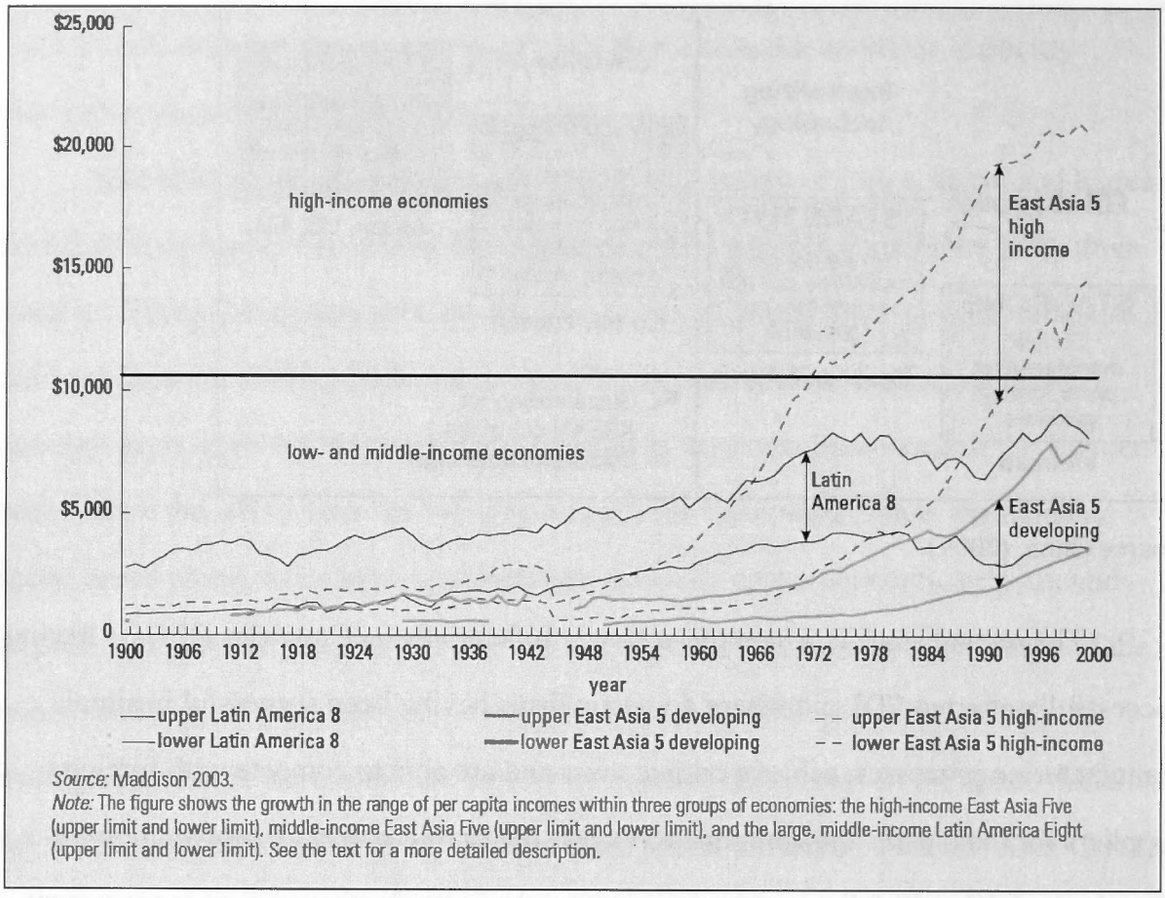
Source Ohno, (2009).

The second stage is where these Newly Industrialising Countries (NICs),[8] having successfully courted FDI and where domestic firms having been successful in simple manufacturing processes, achieve critical mass and are able to compete with foreign suppliers for most parts and components except the most complex. However, domestic firms in the NICs still fail to master important tasks in production such as management, technology design, factory operation, logistics, quality control and marketing. These areas remain dominated by foreigners and foreign firms from countries that are more technologically advanced, such as Japan and Korea.

Countries that cannot break through the second stage by internalising knowledge and industrial skills through replacing foreigners and foreign firms in these areas are likely to remain stuck in a middle-income trap. While Ohno's view is inspired by the East Asian experience, the underlying reasoning is that domestic firms must develop capabilities in the more complex aspects of industrialisation to break through the middle-income trap.

[8] In East Asia, the term Newly Industrialising Countries (NICs) are referred to Thailand, Malaysia, Indonesia and the Philippines. The (East) Asian Tigers were Hong Kong, Taiwan, Korea and Singapore.

Figure 2 The middle-income trap – success and failures



Source: Maddison 2003.
Note: The figure shows the growth in the range of per capita incomes within three groups of economies: the high-income East Asia Five (upper limit and lower limit), middle-income East Asia Five (upper limit and lower limit), and the large, middle-income Latin America Eight (upper limit and lower limit). See the text for a more detailed description.

Source Gill and Kharas, (2007).

The second approach within the industrial structure approach focuses on the types of products that are produced in the economy. The product space method maps the relative proximity or similarly traded products to explain the structural transformation of the manufacturing sector (Hidalgo et al. 2007; Jankowska et al. 2012). The key argument of this approach is based on the successful experience of the East Asian Tigers in beating the middle-income level. Jankowska et al. (2012) note that:

> The focus on the economic structure of a country does not imply a deterministic view of development path. On the contrary, productive transitions are the result of policies, particularly those that aim to influence the economic specialisation of a county. Successful structural change is driven by proximity considerations – with expansion into related industries, making use of existing productive skills – while concomitantly accumulating more advanced capabilities.
>
> Jankowska et al. (2012, p. 43)

The East Asian Tigers' experience suggests that beating the middle-income trap is a function of structural transformation through diversification[9] into a greater number of products, as well as movement into higher value-added products over time. This was done through new production that was sequentially developed in industries such as iron, steel, machinery and electronics, using skills and capabilities that were transferable with relative ease from existing industries. The strategic increase in high 'connectivity' sectors[10] allowed these countries to undertake a gradual yet systematic transition towards higher value added activities, especially those requiring similar technology and production techniques (Jankowska et al. 2012).

This product space approach provides a compelling view on why the Latin American economies are still trapped in the middle-income trap (Jankowska et al. 2012). The eight largest Latin American economies – Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay and Venezuela ('the Latin American 8') – have been in a middle-income trap since the 1970s while Japan and the NICs four East Asian economies – Hong Kong SAR (Hong Kong), the Republic of Korea (Korea), Singapore and Taiwan, Province of China (Taiwan) ('the East Asia 5 high-income') – have graduated to become high-income economies. The product space approach argues that the Latin American economies failed to diversify and upgrade their countries' export structure while the East Asian NICs pursued export-led growth by targeting strategic industries which facilitated gradual diversification and upgrading into new products that required similar skills and inputs. This approach relies on institutions via which coherent and complementary industrial policies in the areas of education, infrastructure, innovation and access to finance are able to be developed and implemented.

Malaysia together with Indonesia, Thailand, the Philippines and China ('the East Asian 5 developing') are currently the next batch of middle-income economies in East

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[9] The degree of diversification has a U-shaped relationship. Increased diversification improves connectivity (the potential to export a particular product) of a country up to a certain extent before it becomes counterproductive (Jankowska et al. 2012).

[10] The 'connectivity' of a country is determined by the degree of diversification of the economy, the export profile of the country and the value of products that remain outside the country's export basket.

Asia that will, at some point, have to navigate out of the middle-income trap (Gill and Kharas 2007). Malaysia, with the highest level of income per capita (upper middle-income economy) in this cohort and having recorded weak economic performance for the past decade, appears to be the first among the second tier East Asian NICs to be caught in the middle-income trap.

The growth trajectories of the East Asian 5 high-income to graduation as high-income economies are all different. Using Ohno's (2009) schema, only Japan, Korea and Taiwan have graduated to stages 3 and 4 while Hong Kong and Singapore have exited. Hong Kong has become a high-income economy by focusing on the services sector while Singapore has specialised in the services sector, the knowledge economy and high value added manufacturing (Gill and Kharas 2007; Thangavelu et al. 2008). Hong Kong has done this through liberalisation of its economy, while Singapore has mixed a strong government presence in strategic sectors[11] with liberalisation of the economy. Both have also leveraged their strategic locations and high human capital. Aoki's (2011) phases of development would see Malaysia attempting to transition from the Kuznets phase to the human capital-based phase but still struggling with institutional reforms.

It may be inferred from the literature that middle-income economies would experience three transformations as put forward by Gill and Kharas (2007) in association with a successful shift in strategy to graduate to a high-income economy. First, diversification will slow and then reverse as countries become more specialised in production and employment. Next, investment will become less important, and innovation should accelerate. Finally education systems will shift from equipping workers with skills that allow them to adjust to new technologies, to preparing them to shape new products and processes (Gill and Kharas 2007).

[11] The Singapore government via its sovereign wealth fund maintains a significant presence in the domestic economy and has controlling interests in several strategic industries.

MALAYSIA'S MIDDLE-INCOME TRAP CHALLENGE

A snapshot comparing Malaysia's basic country and economic profile with selected economies that have graduated and those still stuck in the middle-income trap, provides a useful context to situate Malaysia. On the upper boundary are East Asia's most successful economies that have graduated from the middle-income trap: Japan, Korea, Taiwan and Singapore; recent graduates to high-income economies are Slovenia, the Czech Republic and Poland, and those still stuck in the middle-income trap are Argentina, Brazil and Chile.

The Malaysian economy was the 35th largest in 2010 with a GDP of US$237.8 billion,[12] and accounted for approximately 0.38 per cent of global GDP (when using constant 2000 US$). However, when measured using purchasing power parity (PPP at current international $), it was the 27th largest. The World Bank's country economic classification (into lower-, middle- and high-income economies), uses a measurement termed the Gross National Income (GNI) per capita PPP, Atlas method.[13] This provides for the average per capita income for each country measured in PPP terms in nominal terms. When measured using the World Bank's GNI PPP, the Malaysian economy was ranked 29th largest in 2010 at US$377 billion.[14] Malaysia's current per capita income using this method is US$7,350. Malaysia officially became a middle-income economy in 1994. These three different measurements confirm Malaysia's status as an upper middle-income economy indicating that Malaysia has been 'stuck' in the middle-income

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[12] World Bank ranking of economies based on GDP for 2010 using WDI data. The data are in constant 2000 US$.

[13] GNI per capita (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. GNI, calculated in national currency, is usually converted to U.S. dollars at official exchange rates for comparisons across economies, although an alternative rate is used when the official exchange rate is judged to diverge by an exceptionally large margin from the rate actually applied in international transactions. To smooth fluctuations in prices and exchange rates, a special Atlas method of conversion is used by the World Bank. This applies a conversion factor that averages the exchange rate for a given year and the two preceding years, adjusted for differences in rates of inflation between the country, and through 2000, the G-5 countries (France, Germany, Japan, the United Kingdom, and the United States). From 2001, these countries include the Euro area, Japan, the United Kingdom, and the United States (World Bank Indicators, 2012).

[14] Data from Word Development Indicators. Ranking is provided.

level for the past 18 years. The benchmark to becoming a high-income economy is projected to be US$15,000[15] in 2020 – the year Malaysia's current government, the Najib administration,[16] has targeted Malaysia to become a high-income economy, appears to be within reach.[17]

Malaysia's natural endowment and trade profile suggests that it has all the pre-requisites to graduate from the middle-income trap. Malaysia is the 64th largest country in terms of land mass and 45th in terms of population size. The comparators in the high-income economy category include both larger countries, in terms of land mass and population (such as Japan) and smaller countries (such as Taiwan, Singapore and Slovenia), suggesting that country size is not a key consideration in breaking through the middle-income trap.

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[15] It is currently at US$12,196. The GNI pct PPP is measured using the World Bank Atlas method.

[16] Najib Razak, Malaysia's current Prime Minister of (April 2009 – present), set the target of becoming a high income economy by 2020 through a New Economic Model. This downgraded the previous objective of Dr. Mahathir Mohamad's Vision 2020 (1991) of turning Malaysia into a developed country by 2020. A high income economy need not necessarily be a developed economy.

[17] The NEAC notes that Malaysia would have to grow annually at 6 per cent to achieve this target (NEAC, 2010a). These projections however have come under intense scrutiny and found to be defective by several analysts. The most comprehensive critique of these projections were made by Ong Kian Ming and Teh Chi Chang (March 29, 2012), 'A critique of the ETP-1', Refsa website.

Table 1 Basic country profile, 2011*

Country	Rank by land area[18]	Rank by population	Urban population[19] (%)	Labour participation (%)[20]	GDP (US$)a	GDP pct (US$)b
Japan	61	10	67	52	4.338 t	34,200
Taiwan #	138	50	n/a	48	823.6 b	35,800
Korea	105	25	82	51	1.467 t	30,200
Singapore	184	116	100	59	314.2 b	59,900
Slovenia	150	146	48	59	56.81 b	28,400
Czech Rep	115	79	74	50	262 b	25,600
Poland	69	33	61	56	725.2 b	18,800
Chile	37	59	89	60	260 b	15,500
Argentina	8	32	92	61	596 b	14,700
Malaysia	64	45	72	61	416.7 b	14,700
Brazil	5	5	87	70	2.194 t	10,900

Note *2011 or latest available data; # - data from Central Intelligence Agency (CIA) World Factbook; a – GDP PPP in current US$ (t – trillion, b – billion), b – GDP per capita (pct) PPP in current US$, and c – urban area only.

Source World Development Indicators, (2012).

Furthermore, Malaysia is located within the East Asian region and is integrated within the East Asian global production network (Athukorala 2005; Athukorala and Yamashita 2006). East Asia is economically the most dynamic region in the world and the twenty-first century is predicted to be the 'Asian Century' (Kohli et al. 2011). The spillover effects of this dynamic region will be positive for the Malaysian economy. Malaysia is also fortunate to have a demographic dividend as 70 per cent of its citizens are below the age of 40. This is also a highly urbanised country. Although this brings its

[18] Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones.

[19] Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanisation Prospects.

[20] Labour force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labour for the production of goods and services during a specified period (2007 – 2011).

own set of challenges, the demographic dividend and high urbanisation rates are nevertheless favourable for economic growth (Gill and Kharas 2007).

Table 2 Structure of the economy, 2009

Country	Agriculture		Industry		Services	
	Value added (% of GDP)	Employment (% of total employment)	Value added (% of GDP)	Employment (% of total employment)	Value added (% of GDP)	Employment (% of total employment)
Japan	1.2	3.9	25.9	25.9	72.9	69
Taiwan #	1.4	5.2	31.1	35.9	67.5	58.8
Korea	2.9	7	36.8	16.4	60.5	76.6
Singapore	0.04	1.1	27.9	21.8	72.1	77.1
Slovenia	2.5	9.1	31.2	33.0	66.4	57.4
Czech Rep.	2.2 #	3.1	38.3 #	38.6	59.5 #	58.3
Poland	3.7	13.3	31.74	31.1	64.6	55.6
Chile	3.6	11.2	37.87	23.2	58.6	65.6
Argentina	7.5	1.2	31.80	23.1	60.7	75.2
Malaysia	9.5	13.5	43.81	27.0	46.7	59.5
Brazil	5.6	17	26.83	22.1	67.5	60.7

Note 2009 is selected as it is the most recent data that is available for all the countries selected for comparison; # - Central Intelligence Agency (CIA) World Factbook. Taiwan figures are estimates for 2011 and are percentage contribution of sector to GDP.

Source World Development Indicators, (2012).

At the macro level, the structure of the Malaysian economy appears to be similar to that of high-income economy comparators except that Malaysia has larger agricultural and industrial sectors – both in terms of contribution to GDP and to employment as reported in Table 2. This fits with the economic theory that the contribution of the services sector becomes more dominant as nations specialise and achieve high levels of income. The Malaysian economy has diversified from a largely resource-producing economy (agriculture – rubber and palm oil, and mining – tin and petroleum) to manufacturing although the contribution from natural resources remains

significant (especially palm oil and petroleum). The contribution of the services sector to GDP though, has not shown any significant change over the years.

Malaysia is among the most open economies in the world in the merchandise sector as reported in Table 3. With trade almost equal to twice the size of its GDP, Malaysia's share of global trade is higher than that of many other larger economies or high-income economies, with the exception of Singapore. Malaysia has ranked in the top 25 largest trading nations for the past two decades. Malaysia's integration into the global production network has allowed it to specialise in the export of selected electronic and electrical (E&E) products, which account for almost 85 per cent of total exports. Malaysia's economic openness has been a feature of the Malaysian economy since its independence. Economic openness in the tradable sector, however, is marred by protection in the services sector and some strategic industries such as the auto sector (Menon 2000; 2009; 2012).

Table 3 Merchandise and services trade profile for 2010

Country	Trade to GDP Ratio (2008 – 2010)	Exports (Share & Rank for 2010) [a]		Imports (Share & Rank for 2010) [a]	
		Merchandise	Services	Merchandise	Services
Japan	30.9	5.05 (4)	3.71 (6)	4.49 (4)	4.45 (5)
Taiwan	132.2	1.80 (16)	1.07 (24)	1.63 (17)	1.06 (27)
Korea	107.3	3.06 (7)	2.30 (14)	2.75 (10)	2.71 (12)
Singapore	420.1	2.31 (14)	2.99 (10)	2.01 (15)	2.75 (11)
Slovenia	127.4	0.19 (61)	0.16 (60)	0.19 (61)	0.12 (60)
Czech Rep.	130	0.87 (30)	0.56 (37)	0.82 (30)	0.48 (41)
Poland	83.8	1.05 (26)	0.87 (29)	1.15 (23)	0.84 (31)
Chile	74.8	0.47 (40)	0.29 (49)	0.38 (46)	0.33 (50)
Argentina	41.3	0.45 (42)	0.35 (45)	0.37 (48)	0.39 (45)
Malaysia	177.6	1.30 (23)	0.87 (30)	1.07 (25)	0.91 (30)
Brazil	23.8	1.32 (22)	0.81 (31)	1.24 (44)	1.71 (17)

Note a – Ranks in brackets.

Source World Trade Organisation (WTO) International Trade Statistics, (2012).

On the supply side, Malaysia's profile is mixed as depicted in Table 4. It suffers a serious deficit in human capital with only 5 per cent of its population aged 25 and above having a tertiary education. This outcome is surprising as Malaysia's budgetary expenditure for education is comparable to that of other high-income economies (UNESCO 2012). Malaysia also has a problem with income inequality in general but more so when compared to other high-income economies. This suggests that the benefits of past economic growth have not been evenly distributed. Despite these concerning results, Malaysia still ranks favourably in terms of national competitiveness and technological achievement.

Table 4 Human development, human capital, technology, competiveness and inequality

Country	HDI (rank in 2011-12)	Social burden (> 65) [a] (2011 est.)	Tertiary (25+) 2010 b	TAI c (2009)	Competitiveness (2012)		Gini index & rank*
					IMD	WEF	
Japan	12	23	23.9	5	27	9	37.6 (75) [2008]
Taiwan	n/a	11	10.6	n/a	7	13	32.6 (100) [2000]
Korea	15	11	16.2	1	22	24	31.0 (108) [2010]
Singapore	26	9	12.3	4	4	2	47.3 (29) [2011]
Slovenia	21	17	9	19	51	45	28.4 (120)
Czech Rep	27	16	18	32	33	38	31.0 (109)
Poland	39	14	9.1	36	34	41	34.2 (90) [2008]
Chile	44	10	10.4	41	25	31	52.1 (15) [2009]
Argentina	45	11	3.3	46	55	87	45.8 (37) [2009]
Malaysia	61	5	5	23	14	21	46.2 (34) [2009]
Brazil	84	7	5.2	53	46	53	51.9 (16) [2012]

Note a – percentage of population over 65 years of age; b – percentage of population over 25 years old that have completed tertiary education; c – The Technology Achievement Index (TAI)

focuses on assessing the technological performance based on a country's capability in creating technology but not on the overall size of its technological development; IMD; * latest available data which is given in square brackets

Source Human Development Report, (2012); CIA World Factbook, (2012); Barro and Lee, (2010); Nasir et al. (2011); IMD, (2012); WEF, (2012).

Except for human capital development, technological capability and income inequality indicators, all other economic indicators in comparison to other high-income economies suggest that there is nothing to stop Malaysia from overcoming the middle-income trap. These indicators demonstrate that Malaysia's performance has been resilient despite declining growth rates in the past decade. This raises the question as to the fundamental causes that are contributing to Malaysia's declining economic performance. It also raises other important questions as to whether at this stage of its economic development, past economic strategies and institutional arrangements will suffice in generating the annual growth rates of 7.6 per cent[21] necessary to achieve high-income status over the next 10 years and beyond.

PURPOSE OF THE STUDY AND RESEARCH QUESTIONS

Despite significant improvements in understanding the causes of economic growth, economic theory has yet to provide a satisfactory explanation for the great divergence in economic performance among lower-income economies, with some growing rapidly, others not advancing and with some regressing (Helpman 2004). Easterly (2002) notes that the secret to sustained growth is 'elusive' while the Commission of Growth and Development (CGD 2008) notes that:

> No one can identify all the reasons why some economies lose momentum, and others don't...When a country is far behind the leading economies, says Philippe Aghion, a leading growth theorist at Harvard University, "it is very clear what you have to do, so you can run things like an army." But as an economy catches up with the leaders, it becomes less obvious what it should make and where its prosperity lies.
>
> CGD (2008, p. 83)

[21] Calculations by Ong Kian Ming and Teh Chi Chang suggest that these are the required growth average annual rates to achieve the US$15,000 target. Refsa, 29 March 2012, A critique of the ETP 1, Refsa.

Hence, the interest in the study of economic growth has shifted from focusing on the accumulation of capital and other productive factors towards a focus on the quality of institutions to support growth (Kong 2007). There is now a growing consensus that the factors of production may only be the proximate cause of growth, but that they do not provide an underlying explanation for the success or failure in growth itself, and that geography and openness to trade and above all institutions appear to be more important factors (Rodrik et al. 2004; Acemoglu et al. 2005; North et al. 1990). A unique feature of Malaysia is its ethnically based political system which is not prevalent among developed economies. Moreover, Malaysia's multi-ethnic citizenry makes it especially different from the homogenous East Asian Tigers'. This characteristic has bearings on institutional development too.

This then raises the possibility that the fundamental challenge that Malaysia faces in overcoming the middle-income trap is not exclusively focused on the quality of its factors of production, endowments or trade only but more to the quality of Malaysia's institutions and its governance. The purpose of this study then becomes clear. Firstly, it aims to investigate the impact of current domestic institutions and governance on economic growth in Malaysia. In order to do that, it must be established that institutions and governance actually do matter to economic performance, and if this is the case, then how? More importantly, what type of institutions matter and at what levels of income? Finally, how does governance of these institutions relate to the quality of these institutions and, in turn, to economic growth?

The literature review of the various theories that have been put forward to explain the middle-income trap also posit that to overcome the middle-income trap countries will have to specialise, be driven either by comparative or locational advantage, or develop the technological capacity and capability at the higher stages of the industrialisation process. This specialisation requires high levels of human capital

development and better social policies as this specialisation will have an adverse effect on income inequality, which is of paramount importance for social stability in Malaysia.

In this context, the already mediocre performance of human capital development and the high income inequality in Malaysia raises several further important questions. What are the institutional and governance challenges that Malaysia is facing in the area of human capital development and broader social policies that result in these mediocre outcomes and what are the institutional reforms that are required to address these outcomes in order to overcome the middle-income trap?

These raise two broad key issues that underlie Malaysia's challenges in overcoming the middle-income trap from an institutional perspective:

i. What are the domestic institutional issues that are constraining Malaysia's economic growth and its ability to overcome the middle-income trap?
ii. What are the possible institutional reforms needed to facilitate Malaysia's return to a high growth path?

This research seeks to address these two broad issues by answering the following research questions:

i. What are the impact of the different types of institutions and governance on economic output at the different income levels?
ii. How do the relevant educational and training institutions and their governance influence human capital development in Malaysia in the context of overcoming the middle-income trap?
iii. How do the relevant institutions tasked to address income inequality in Malaysia contribute towards overcoming the middle-income trap?

RESEARCH APPROACH

Undertaking institutional analysis on economic growth with a country focus can be an extremely difficult task; nevertheless, one that is necessary and worthwhile. The approach adopted here is drawn from an expert survey undertaken by Arvanitidis et al.

(2010). This survey involved 650 experts in the field of economics in the public and private sector, and from academia. The experts were asked five questions, one of which forms the basis of the research method taken in this study. The experts were asked to firstly to evaluate the suitability of the main research methodologies in explaining the determinants of economic dynamism and then to rank the research methodologies. The results are reported in Table 5.

Table 5 Methods to explore determinants of economic dynamism

Rank	Methods	Average Rank	First choice (%)
1	In-depth case studies	1.83	42.79
2	Formalism/modelling	2.08	31.97
3	Historical analysis	2.08	24.04

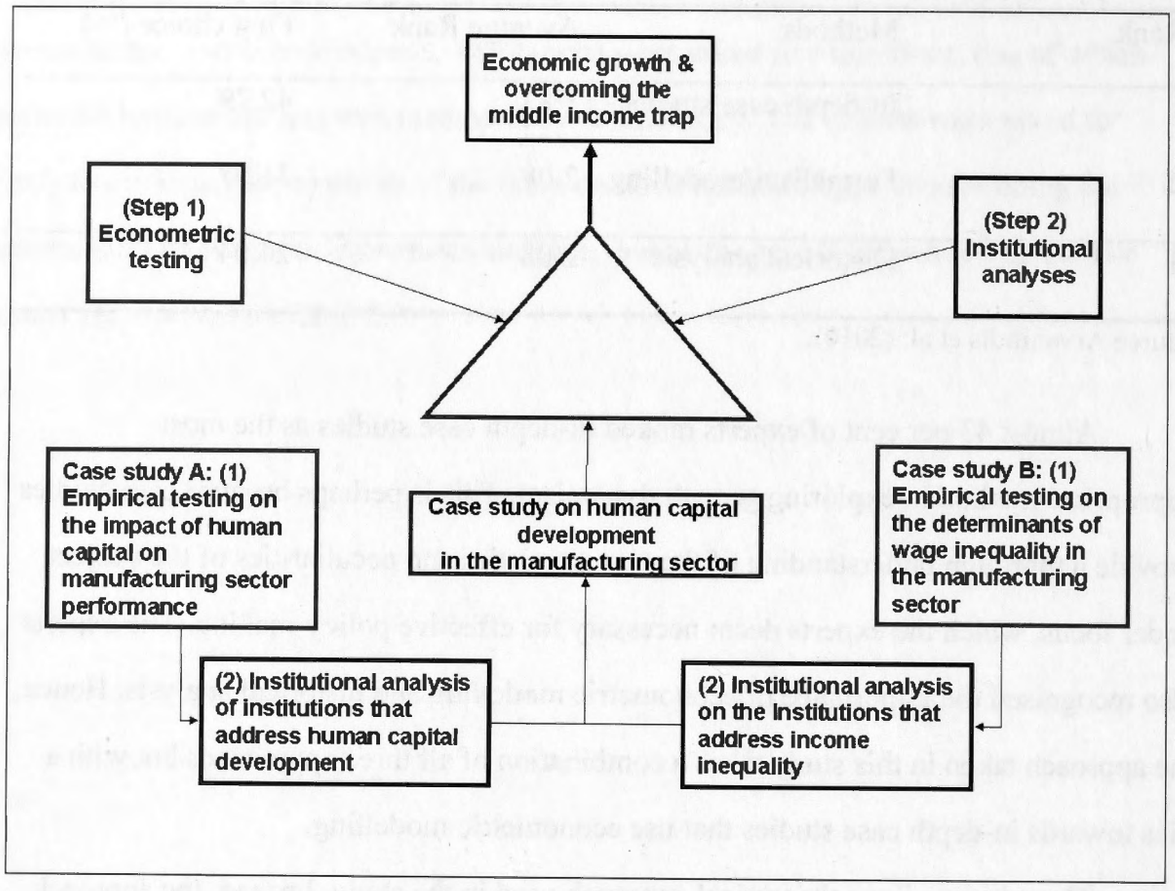
Source Arvanitidis et al. (2010).

Almost 43 per cent of experts ranked in-depth case studies as the most appropriate method in exploring growth dynamism. This is perhaps because case studies provide a thorough understanding of the characteristics and peculiarities of the subject under focus, which the experts deem necessary for effective policy-making. The experts also recognised the importance of econometric modelling and historical analysis. Hence, the approach taken in this study takes a combination of all three approaches but with a bias towards in-depth case studies that use econometric modelling.

There is no unique theoretical approach used in the study. Instead, the approach is eclectic (see Figure 3). The empirical approach is informed mainly by neoclassical economic theory while the institutional analysis is a combination of evolutionary economics, new institutional economics and economic sociology.

This is achieved through two stages. First, the impact of institutions on economic growth across all countries over a period of time is undertaken. This generalised and comparative view that utilises the stochastic frontier model, allows the researcher to rank the performance of each country, measure the impact of institutions on economic growth, and identify the key trends at the macro level, across individual countries, for a period of time.

Figure 3 Analytical framework for the research



However, the generalised view does not explain 'the characteristics and peculiarities of the subject under focus, which the experts deem necessary for effective policy-making' (Arvanitidis et al. 2010, p. 80). Gerring (2004, p. 342) defines a case study as, 'an intensive study of a single unit for the purpose of understanding a larger class of (similar) units.' The case study approach therefore can be used to address the challenge of analysing the core issues affecting Malaysia as it allows for an in-depth analysis of an issue that can be representative of a larger phenomenon.

This research uses human capital development in the manufacturing sector (as the single unit) to understand the fundamental reasons behind, and provide an explanation for Malaysia's declining economic performance (the larger class of similar units). Human capital development in the manufacturing sector is selected for several reasons. Firstly, human capital and technology are now recognised as key proximate drivers of long term economic growth (Kohli et al. 2011). Secondly, the two key

indicators where Malaysia diverges significantly from successful East Asian economies are in human capital development and income inequality. Thirdly, the literature on the middle-income trap has also identified that human capital development and income inequality are among the two most important issues that must be addressed when faced with structural changes that comes with overcoming the middle-income trap.

The manufacturing sector is selected primarily because of its leading role in the Malaysian economy. Furthermore, there are few other sectors that are as trade-exposed as the manufacturing sector although several strategic or politically sensitive industries have protection. The success or failure of the liberalisation strategies used in the manufacturing sector is important in understanding and explaining Malaysia's middle-income trap. Finally, the manufacturing sector is also chosen also because it is the backbone of Malaysia's export-oriented-industrialisation strategy and one of the key sectors in the government's strategy in developing technological capacity, capability and for industrial upgrading.

There is no specific theoretical approach used in this research. Instead a combination is used. The empirical approach most suitable for this research, the stochastic frontier model (Battese and Coelli 1992; 1995; Kalirajan and Shand 1999) and a modified industry wage equation model (Allen 1996), are based mainly on neoclassical economic theory. The institutional analysis is a combination of evolutionary economics and new institutional economics. Table 6 maps out the relationship between the three main research questions, the theoretical approach and the research method employed.

Table 6 Mapping the research questions, methods and chapters

Research question	Theoretical approach	Research Method	Chapter
1. What is the impact of the different types of institutions and governance on economic output at the different income levels?	Neo-classical economics	Stochastic frontier econometric analysis	Chapters 4 and 8
2. How do the relevant educational and training institutions and their governance influence human capital development in Malaysia in the context of overcoming the middle-income trap?	Neo-classical economics, evolutionary economics and new institutional economics	Case study and stochastic frontier econometric analysis	Chapters 5, 7 and 8
3. How do the relevant institutions influence income inequality in Malaysia in the context of overcoming the middle-income trap?	Neo-classical economics, evolutionary economics and new institutional economics	Case study and econometric analysis	Chapters 6, 7 and 8

ORGANISATION OF THE ARGUMENTS

The analysis proceeds as follows. Chapter 2 provides a literature review on the theories of economic growth. The review focuses on three key issues: the transformation of the growth literature from a focus on 'factor accumulation' to the 'deep structural determinants' of growth; what these growth theories say about long-run economic growth; and the role of institutions within the analysis of growth. This chapter identifies the key role played by institutions in overcoming the middle-income trap.

Chapter 3 focuses the discussion on institutions and institutional analysis and has four objectives. The first three are: to identify a suitable definition for institutions; to identify a schema to classify institutions; and to identify an appropriate method to measure them. These three objectives are important in developing a framework that can meaningfully explain the role of institutions in contributing to Malaysia's current human capital development and income inequality outcomes which is addressed in

Chapter 7. This framework is also relevant in identifying suitable and feasible reform measures which are addressed in Chapter 8.

Chapter 4 analyses the links between institutions and the economic performance of a set of countries at different income levels, using a stochastic frontier model. The key objective of this chapter is to identify, in general, the types of 'institutions that matter' at the different income levels. This analysis is done for a large sample of countries over a specified period of time. Malaysia's economic performance in relation to the other economies over this period of time at the macroeconomic level is also discussed to identify broad trends.

Chapter 5 drills deeper into the Malaysian economy by analysing the impact of human capital development on manufacturing sector output. It is the first case study that provides the basis for the in-depth institutional analysis in Chapter 7 on the links between human capital development and manufacturing sector output. In particular, this chapter investigates the contribution of the different factors of production to manufacturing sector output. The variable of interest is labour, in particular how the different skills level contributes to manufacturing sector output. This analysis enables the research to determine whether human capital is indeed a constraint to technological upgrading in the manufacturing sector as part of Malaysia's efforts in overcoming the middle-income trap.

Chapter 6 supplies the second case study that also drills further into Malaysia's institutions. It provides the basis for an institutional analysis in Chapter 7 on the determinants of wage inequality among the different skill levels among labour in the Malaysian manufacturing sector. The key determinants that the chapter focuses on are trade, technology and migrant labour. This analysis enables the research to determine whether current strategies to address income inequality in the manufacturing sector have been effective.

Chapter 7 undertakes an institutional analysis of human capital development and income inequality based on the empirical findings in Chapters 5 and 6. This chapter also

relates the analysis at the sectoral level with the macro level. In doing so, the chapter also identifies the current institutional weaknesses in human capital development and in addressing income inequality within the context of overcoming the middle-income trap.

Chapter 8 concludes with a summary of the key research findings, and presents several key recommendations on institutional reforms based on the institutional analysis in Chapter 7 on human capital development that might assist Malaysia's attempts to overcome the middle-income trap.

Chapter 2 Economic growth and institutions

> What makes some countries rich and others poor? Economists have asked this question since the days of Adam Smith. Yet after more than two hundred years the mystery of economic growth has not been solved.
>
> Helpman (2004, p. 1.)

The literature on economic growth explores many of the proximate factors that influence the success with which countries escape from poverty and become rich. What is less clear is why some countries succeed and others fail, and why some countries that appear to be on the way to becoming rich, falter while others surge forward. This review discusses three key issues: the transformation in the focus of the growth literature from the importance of 'factor accumulation' to the importance of 'deep structural determinants' of growth; what these growth theories say about long run economic growth; and the role of institutions in the growth process. The key interest in this chapter is in the circumstance as it appears to apply to the case of Malaysia.

THEORIES ON ECONOMIC GROWTH

Why are some countries rich and many others poor? Why are there significant differences in living standards between the Organisation for Economic Cooperation and Development (OECD) countries – 34 of the richest economies in the world – and non-OECD countries? What are the mechanisms that drive economic growth? Why does growth take off in some countries and not in others? Attempts to answer these fundamental questions by economists have led to two key approaches in the growth literature. Understanding this literature is important to unravelling the puzzles about Malaysia's economic growth performance.

The first is the Solow (1956) or the neo-classical growth model. In this model, economic growth comes from capital accumulation and it is only temporary. The diminishing marginal productivity of capital per worker implies that in the long-run all countries should converge to the same level of per capita income. They also have the

same growth rate of growth, and that depends on the rate of technological progress. The rate of technological progress is assumed to be exogenous and thus does not respond to incentives to innovate.

The key prediction of this Solow growth model is that poor countries will grow faster and eventually catch up with the rich countries. While there are examples of catching-up economies, empirical data for all countries does not support this prediction. Barro and Sala-i-Martin (1992) and Mankiw et al. (1992) argue that the Solow model does not predict absolute convergence but conditional convergence. They reason that countries differ in their savings rates and population growth rates, and these differences lead to differences in their income levels in the long-run. By controlling for these determinants of the long-run income levels, they find evidence of conditional convergence, where rich countries and poor countries converge to different income levels.

Notwithstanding these findings, the lack of absolute convergence and, more critically, the increased divergence between rich and poor countries observed despite increased capital flows from capital rich to capital poor countries, implies that accumulation is not the driving force behind growth (Helpman 2004). Mankiw et al. (1992) did try to address this shortcoming of the Solow model by including human capital. However, under the assumption of diminishing rates of return, human capital also fails as the determinant of long run growth.

The theory of endogenous growth is the second key approach in thinking about economic growth. It addresses the limitations of the Solow model. The key departure in this theory from the Solow model is its assumption of non-diminishing returns to human capital accumulation. Proponents of endogenous growth theory argue that positive externalities from knowledge creation can generate increasing returns to scale which offset the decreasing returns to scale from other factor accumulation. This leads to sustainable long run growth. This approach, pioneered by Romer (1986 and 1990) and

Lucas (1988) extended the contribution of capital accumulation to encompass intangible capital – human skills and the stock of knowledge — as key explanators of growth.

A typical representative of this approach is Romer (1990). Innovators have the incentive to innovate since they have copyrights or patents of their innovation. This secures them monopoly profits, at least in the short to medium term. At the same time the innovators create knowledge that is not embodied in the innovation that is available to the public. This implies that countries that allocate larger resources to R&D will have higher productivity growth.

Unfortunately, endogenous growth models also do not satisfactorily answer fundamental questions about economic growth. In identifying R&D and innovation by profit-seeking firms as the key determinants of technological advancement that drives long term growth, this approach fails to incorporate a crucial variable: the regulatory and policy settings – or institutions – that shape firms' incentive structures. Once new technology is available, the pace of technological progress largely depends on the process of adoption. This is also determined by many institutional factors. Mokyr (1990; 1992; 2001) points out that technological inertia and economic stagnation are common in history mainly due to resistance through institutions (and the rules and norms that affect whether the market is permitted to be the arbiter of whether a new technique is adopted) and organisational opposition embedded within the structure of institutions. This has led economists to look for other deep determinants of growth.

THEORIES OF THE DEEP DETERMINANTS

There is a growing literature that identifies institutions broadly defined to include socio-cultural institutions, geography and trade as 'deep determinants' in explaining the variations observed in economic growth across countries.

Institutions

There is no consensus on a unified definition for institutions. Institutions can be viewed either from a disciplinary, epistemological or geographical perspective (Djelic 2010). When viewed from a disciplinary perspective, the fundamental role of property rights are a key feature of the new institutional economics (Matthews 1986; North 1990; Menard and Shirley 2005), the importance of socio-cultural factors are stressed in economic sociology (Granovetter 1985; Knack and Keefer 1997), and political science focuses its explanation of economic growth on political factors (Lipset 1959; Brunetti 1997).

In the economics discipline, Douglass C. North's definition of institutions has come to be accepted as the standard. Institutions, according to North (1991) are:

> The humanly devised constraints that structure political, economic and social interaction. They consist of both information constraints (sanctions, taboos, customs, traditions, and codes of conduct) and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity.
>
> North (1991, p. 97)

North popularised what is now termed the institutionalist approach. The institutionalist approach distinguishes between the proximate and deep determinants of growth. It argues that the conventional determinants of economic growth such as innovation, economies of scale, education, capital accumulation are the proximate cause of growth while the fundamental sources of growth derive from institutions broadly defined (North and Thomas 1973; Rodrik et al. 2004; Acemoglu et al. 2004). This approach is gaining widespread acceptance in the analysis and understanding of economic growth.

It was not until after Douglass C. North won a Nobel Prize for his work on institutions and economic history in 1993, that the institutional determinants of growth

began to be examined empirically in a more formal way (Knack and Keefer 1995; Mauro 1995; Hall and Jones 1999; Acemoglu et al. 2002 and 2005; Rodrik et al. 2004). Rodrik (1999) had earlier highlighted five key institutions — property rights, regulatory institutions, institutions for macroeconomic stabilisation, institutions for social insurance and institutions of conflict management — which not only exert direct influence on economic growth but also affect other determinants of growth such as physical and human capital, investment, technical change and the economic growth processes. On these grounds Easterly (2001) argues that none of the traditional factors would have any impact on economic performance if there had not been developed a stable and trustworthy institutional environment.

Economic policies – which can be thought of as a function of economic institutions – and macroeconomic conditions – which are partially an outcome of these policies – have also, attracted much attention as determinants of economic performance (Kormendi and Meguire 1985; Grier and Tullock 1989; Barro 1991 and 1997; Easterly and Rebelo 1993; Fischer 1993; Barro and Sala-i-Martin 1995). Economic policies set the framework within which economic growth takes place and influence several aspects of an economy, for example, through investment in human capital and infrastructure, improvement of political and legal institutions. Macroeconomic conditions are regarded as necessary but not sufficient conditions for economic growth (Fischer 1993). In general, a stable macroeconomic environment may favour growth, especially, through reduction of uncertainty, whereas macroeconomic instability may have a negative impact on growth, through its effects on productivity and investment by increasing uncertainty. These studies of the links between economic policies and their outcomes demonstrate the importance of institutions in the development, implementation and monitoring of economic policies.

Interest in the relation between political factors and economic performance was first raised by Lipset (1959). This triggered several other studies which concluded that the political environment plays an important role in economic growth (Kormendi and

Meguire 1985; Scully 1988 and 1992; Grier and Tullock 1989; Brunetti 1997). These studies usually assess the political environment using variables such as political stability and degree of democracy. At the most basic level, political stability – like macroeconomic stability – would appear to reduce uncertainty, encouraging investment and eventually advancing economic growth.

It is also argued that the type of political regime (democratic and non-democratic) also has an impact on economic growth. However there is no consensus to date on which type of political regime is better but political stability has a positive impact on growth. The literature has found evidence in support of both types of political regimes. For example, democratic regimes may both retard and enhance economic growth (Alesina et al. 1996; Helliwell 1994; Barro 1991; Przeworski 2004). Alesina et al. (1996) in their study of the links between political instability finds that political instability reduces growth. It is more pronounced for the case of unconstitutional executive changes such as coups, as well as for changes in ideological composition of the executive but less significant for regular and frequent turnovers in industrial democracies. They however find no difference in the performance between democracies and non-democracies but that the occurrence of a government change increases the likelihood of subsequent changes, suggesting that political instability tends to be persistent. Przeworski (2004) when examining the mutual relation between political regimes and economic growth also comes to the same conclusion, finding no evidence that different types of political regimes have different types of impact on the rate of investment or the growth of total income while Helliwell (1994) finds that although democracy has no direct effect on economic growth, it exerts an indirect effect on growth through education and investment. Barro (1991) also found that political stability and growth rates are positively linked.

The theoretical foundations to this ambiguity are related to two diametrically opposed thinking of democracy. The opponents argue that democracies are unstable and absolutist regimes were more likely to improve public welfare simply because they

could not promote their own interests otherwise (Doucouliagos and Ulubasoglu 2006 citing Hobbes 1651) while Huntington (1968) argued that democracies have weak and fragile political institutions and lend themselves to popular demands at the expense of profitable investments. Democratic governments are vulnerable to demands for redistribution to lower-income groups, and are surrounded by rent-seekers (Krueger 1974; Bhagwati 1982). Absolutist regimes can implement coercively the hard economic policies necessary for growth, and suppress the growth-retarding demands of low-income earners and labour in general, as well as social instabilities due to ethnic, religious and class struggles. This view also argues that democracies cannot suppress such conflicts. Therefore, for economic progress, functioning markets should be prioritised and authoritarian regimes can easily facilitate this.

The proponents argue that rulers are potential looters and democratic institutions act to constrain them (North 1990). Authoritarian governments have the tendency to confiscate assets if it can expect a brief tenure (Olson 1993), or even in the long-run (Bhagwati 1995) for more corrupt and extravagant use of resources, internally inconsistent policies, and short-lived and volatile economic progress (Doucouliagos and Ulubasoglu 2006). Rodrik (2000) goes further and argues that democratic regimes can be the meta-institutions for building market supporting institutions.[22]

Religion, culture, ethnicity and language

Religion, culture, ethnicity and language are important socio-cultural institutions that can also impact economic growth (Barro and McCleary 2003; Bjornskov 2005; Huntington 1996; Landes 1998; Noland 2003; North 1990 and 1992; Temple and Johnson 1998; Weber 1930).

How they affect economic growth is varied and has been analysed from different aspects. Social capital is one popular method that is often used to measure the impact of

[22] Rodrik (2000) discusses five types of institutions: institutions: property rights; regulatory institutions, institutions for macroeconomic stabilisation; institutions for social insurance and institutions for conflict management.

these socio-cultural institutions on economic growth. Other conventional ways have been to measure the key components of what makes-up these social-cultural institutions such as ethnic and language composition, religious beliefs, attitudes and values.

Social capital refers to institutions, relationships and norms that shape the quality and quantity of society's social interactions. A narrow view of social capital regards it as a set of horizontal associations between people, consisting of social networks and associated norms that have an effect on community productivity and well-being (Putnam 1993).

A broader understanding of social capital accounts for both the positive and negative aspects by including vertical as well as horizontal associations between people, and includes behaviour within and among organisations (Coleman 1988). The view recognises that horizontal ties are needed to give communities a sense of identity and common purpose, but also stresses that without 'bridging' ties that transcend various social divides (for example, religion, ethnicity, socio-economic status), horizontal ties can become the pursuit of narrow interests, and can actively preclude access to information and material resources that would otherwise be of great assistance to the community (for example information about government programmes that are not publicised).

The broadest and most encompassing view of social capital includes the social and political environment that shapes social structure and enables norms to develop. This analysis extends the importance of social capital to the most formalised institutional relationships and structures such as government, the political regime, the rule of law, the court system, and civil and political liberties (North 1990; Olson 1982). This view not only accounts for the strengths and weakness of social capital, and the importance of forging ties within and across communities, but recognises that the capacity of various social groups to act in their interest depends crucially on the support (or lack thereof) that they receive from the state as well as the private sector. Similarly, the state depends on social stability and widespread popular support. In short, economic

and social development thrives when representatives of the state, the corporate sector, and civil society create forums in and through which they can identify and pursue common goals.

Religion – which contributes to social capital – as a deep determinant of economic growth can be categorised into two key arguments (Noland 2003). In the first argument, religion functions as a club. In *The Wealth of Nations*, Adam Smith (cited in Anderson 1988) argued that participation in a religious group could potentially convey two economic advantages to adherents. The first could be a reputational signal to potential employers, lenders and customers. Second, these religious groups could provide an extra-legal means of establishing trust and sanctioning deviants in intra-group transactions. These translate into a reduction in risk or uncertainty associated with a particular individual or transaction and improving efficiency and allocation of resources – necessary for long term growth.

This interpretation does not take into consideration the actual nature of religious belief as this reasoning can be extended to a wide range of voluntary associations and not just religious organisations per se and is relevant in explaining economic growth.

The second — the moulder-of-behaviour argument associated primarily with Max Weber — is more controversial. In this argument, the content of religion is crucial. In 'The Protestant Ethic and the Spirit of Capitalism,' (Yang 1964 cited in Noland 2003) Weber argued that the Protestant Reformation was critical to the rise of capitalism through its impact on belief systems. The point of departure of Weber's analysis was 'the ethical discrepancy between religious values and the given world.' (Yang 1964 cited in Noland 2003). From this, religions could be classified according to their acceptance or rejection of the world; if acceptance, the presence or absence of tension toward the world and whether the fostered orientation of transformation, adaptation or escape from the given world. Weber also argued that the Calvinistic doctrine resulted in a 'this-worldly asceticism' which focused adherents on diligent,

efficient economic activity, thrift and non-ostentatious accumulation of wealth. These characteristics, according to Weber, were the bedrock of modern capitalism.

Landes (1998) would argue along these lines with a focus on the role of religious institutions of the different religions (Protestant and Catholic) in promoting or curtailing values such as scientific thought and profit-making. Landes concluded that Protestant religious institutions did not curtail but supported these values, contrary to Catholic institutions (Landes 1998).

Weber's hypothesis attracted widespread criticism (Noland 2003). A contemporary example serves as illustration. Weber had noted that Confucianism was inimical to growth and that the Hindu caste system blocked capitalist development. The economic success of Confucian China and countries such as Japan, Korea, Taiwan and Hindu India in recent times seems to disprove Weber's assertions.

There appears to be more clarity on ethno-linguistic fragmentation. It is argued that higher ethno-linguistic fragmentation in a country has negative direct and indirect effects on economic performance and quality of institutions (Okediji 2010). The key argument is that there is greater likelihood for competition among the differing interest and ethnic groups for the provision of public goods, leading to poor quality decisions (Alesina and Drazen 1991; Alesina and Rodrik 1994; Alesina and Tabellini 1990; Alesina and Spoloare 1997; Collier 2000; Shleifer and Vishny 1993). Ethno-linguistic fragmentation can also lead to higher levels of government consumption and thus divert resources away from macroeconomic variables needed to promote and sustain economic development (Annet 1999).

Geography

While institutional, religious and cultural theories emphasise the importance of man-made factors in shaping economic incentives, an alternative approach is to focus on the role of 'nature', that is, on the physical and geographical environment. In the

context of understanding cross-country differences in economic performance, this approach emphasises differences in geography.

The role of geography in economic growth has been long recognised. There are several aspects of growth performance that relate to geography. The first aspect is climate. With significant differences in incomes per capita between countries in temperate and the tropical zones, climate appears an important factor. That climate may be an important determinant of work effort, incentives or even productivity goes back at least to Montesquieu and Alfred Marshall (cited in Acemoglu et al. 2005). The climate argument postulates that people in the tropics are not sufficiently industrious due to the extreme heat. Moreover, the easy access and availability of food encourages idleness (Acemoglu et al. 2002; Easterly and Levine 2003).

A scientific explanation for the above claim is provided by Parker (2000, cited in Bhattacharyya, 2006) who argues that an individual's desire to maximise utility is dependent on motivation and physiological activities. The activity of the hypothalamus is heavily dependent on thermodynamics. In hot conditions, the hypothalamus secretes hormones which negatively affect motivation and enterprise while in cold climates this does not happen – and individuals *may be* naturally more diligent.

The second view is that geography may determine agricultural productivity due to climatic and soil conditions (Gallup and Sachs 2000; Sachs 2001; Myrdal 1968). The tropics, with high relative humidity, high temperatures, soil that lacks nutrients and increased number of pests, leads to deficiencies in plant growth and lowers agricultural productivity.

The third perspective is that geography determines technological differences among different regions (Diamond 1997). According to this view, Europe's conquest of the Americas was possibly due to the differences in all aspects of technology between the Europeans and the Americans. The Europeans were far more advanced than the Americans because of their longer history as densely populated societies which were dependent on food production. The improved food production system created surplus in

resources in Europe which allowed for investment in areas such as weapons and transport. Europeans' close contact with large mammals in their efforts to domesticate them, allowed them to develop immunity to various epidemics which occurred regularly. This was not the case in the Americas. A related view is that the agricultural technology introduced by the Europeans in countries that they colonised was inappropriate. This led to stagnation of the agriculture sectors in these colonies (Diamond 1997).

A final perspective on geography is the proximity-of-market view which has links to trade theories. According to this view, unfavourable geographic location characterised by no or limited access to ports or ocean navigable waterways, and being landlocked are major impediments to trade and commerce (Sachs and Warner 1995; Sachs and Warner 1997; Gallup et al 1998). Access to port facilities or major markets in this situation often involves crossing international borders. This raises transportation costs and limits international trade. Without international trade, commercial activities are confined to the domestic economy which is often small and leads to problems associated with closed economies such as inefficient division of labour and underdevelopment.

A related theory is the new economic geography. This theory asks the question of why firms locate their establishment's in particular geographical locations. Allowing for increasing returns to scale, imperfect competition and non-zero transport costs, new economic geography (Krugman 1991; Fujita et al. 1999) argues that economic activity tends to agglomerate in specific areas to enjoy plant-level economies of scale and proximity to customers and suppliers in order to reduce transport costs. This gives rise to 'agglomeration economies' or advantages of coalescing geographically. The process is self-reinforcing, due to increased positive externalities, backward and forward linkages between firms and scaled economies. Although negative externalities and

intensification of competition can give rise to centrifugal effects,[23] these forces are unlikely to induce a balanced pattern of growth. This theory suggests that certain locations would experience higher economic growth than others due to these factors.

Trade

International trade or trade liberalisation is another potentially significant determinant of economic growth. In general, it is conventionally argued that trade liberalisation enables the exploitation of comparative advantage, technology transfer and diffusion of knowledge, increasing scale economies and exposure to competition. Therefore, countries that have an open economy can escape from diminishing returns because trade allows countries to specialise which increases productivity and returns to capital – all of which drives long term growth. Trade also increases market size, reduces the duplication of R&D, increases knowledge spill-over, and increases specialisation – with the cumulative effect of increased R&D and productivity. A large number of studies have confirmed such positive relationships (Dollar 1992; Sachs and Warner 1995; Edwards 1998; Dollar and Kraay 2003). This also helps to explain why small countries, such as the high performing East Asian economies were able to grow fast.

Growth theories have now included trade as a key variable. Extensions of the endogenous growth theory demonstrate that international trade affects economic growth positively by facilitating learning-by-doing, specialisation and spill-over (Lucas 1988; Young 1991) transfer of knowledge and R&D activities (Grossman and Helpman 1991) and scale-effect (Rivera-Batis and Romer 1991).

Increased competition due to trade liberalisation can cause factor prices to change. This in turn can lead to a decline in productivity. In addition, trade does not necessarily imply convergence of income levels. If R&D spill-overs are international in

[23] Krugman explains that the 'centrifugal' effect of widely dispersed resources, which tends to push economic activity into spreading out, would be opposed by the 'centripetal' pull of access to large markets, which tend to promote concentration of economic activity.

scope, there will be convergence and if they are national in scope, there will be divergence (Helpman 2004).

EMPIRICS OF THE DEEP DETERMINANTS OF GROWTH

This literature on the theories of the deep determinants of growth suggests two possible conclusions. The first conclusion is that institutions broadly defined to include policy institutions and socio-cultural factors matter in determining incomes and growth rates. The second conclusion is that productivity growth and not factor accumulation alone may be a main driving force behind growth performance.

The first to suggest empirically the links between institutions and economic growth were Kormendi and Meguire (1985) when they introduced a measure for civil liberties in their set of explanatory variables for growth. They found that an index of civil liberties, which captured political freedom and democracy supported by constitutional law, had a positive relationship with growth. This index of civil liberties, however, explained growth only marginally but dominated the other variables when explaining investment.

Political instability as a variable that influences growth was first suggested by Barro (1991) in his seminal paper that sought to explain economic growth for a large sample of countries. Barro found that average growth rates are positively related to political stability. Barro interpreted this as capturing the benefits of secure property rights.

Attempts to measure explicitly the links between institutions and economic performance were pioneered by Knack and Keefer (1995) and Mauro (1995). Knack and Keefer analysed different proxies that were used to capture the links between institutions and economic growth while Mauro investigated the links between corruption and growth. Knack and Keefer found that institutions that protected property rights were crucial to economic growth and that their effects are persistent while Mauro found that corruption lowers investment, thereby lowering economic growth.

Knack and Keefer (1997) also measured the impact of social capital on economic growth by using indicators of trust and civic norms from the World Values Survey for a sample of 29 market economies. They use these measures as proxies for the strength of civic associations in order to test two different propositions on the effects of social capital on economic growth, the 'Olson effects' (associations that stifle growth through rent-seeking) (Olson 1982) and 'Putnam effects' (associations that facilitate growth by increasing trust) (Putnam 1993). They conclude that trust and civic norms are stronger in nations with higher and more equal incomes, with institutions that restrain predatory actions of chief executives, and with better-educated and ethnically homogenous populations.

Empirical work on the impact of religion on economic growth is inconclusive. Bhattacharyya's (2006) thesis which analysed the relative contribution of what he terms root causes or deep determinants (institutions, geography, trade openness, religion and culture, and knowledge) of economic growth finds that Catholicism is associated with poor institutions and is not good for trade.

The large number of Muslims living in poverty had also raised the possibility that Islam was inimical to growth (Kuran 1997).[24] Guiso, Sapienza and Zingales (2002) analysing the World Values Survey data, assert that among the adherents of the world's major religions, Muslim's are the most anti-market. However, Noland (2003) disproves Guiso et al.'s findings in his investigation of whether religious contents affected growth and noted that that the impact of Islam on economic performance is indeterminate. Barro and McClearly (2002) find religious affiliation statistically significant, but they find no robust relationship between adherence to major world religions and national economic performance.

The Islamic religion, proxied through Muslims population share, when introduced into standard growth models, does not provide robust statistical results.

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[24] Kuran (1997) provides a review of the various arguments put forward to explain the underdevelopment of Muslims or Muslim majority nations.

Muslim countries do not appear to deviate systematically from the norm in any observable way. The economic performance of Muslim countries is what its economic fundamentals would suggest (Noland 2003; Noland and Pack 2004).

In the paper titled 'Africa's Growth Tragedy', Easterly and Levine (1997) attributed Africa's poor performance to its high level of ethnic diversity. They show that ethnic diversity affects economic performance by working indirectly through public policies, political instability and several other economic factors. In a cross-section of 122 countries, Grafton, Kompas and Owen (2007) show that, even after controlling for initial income, investment rate, trade openness, technology, measures of mass communication and institutional quality, linguistic barriers to communication reduces productivity and capital accumulation.

There have also been several studies that demonstrate how other aspects of poor quality institutions lead to slow growth and low incomes. Corruption has been found to impact negatively on investment and hence capital accumulation (Mauro 1995). Furthermore, low quality institutions have also been found to reduce aggregate productivity (Hall and Jones 1999). In their analysis, Hall and Jones showed that differences in physical and human capital explained only partially the variation in output per worker. They note that differences in capital accumulation, productivity and hence, output per worker were driven by differences in institutions and government policies, which they termed social infrastructure. Differences in growth rates among developing countries can also be caused by differences in the quality of institutions (Olson et al. 2000).

There have been a number of recent empirical studies affirming that geography – natural resources, climate, soil conditions, topography and 'landlocked-ness' – have a direct impact on economic growth affecting (agricultural) productivity, economic structure, transport costs and competitiveness (Sachs and Warner 1997; Bloom and Sachs 1998). Researchers used numerous variables, including latitude, proportion of land close to coast, average temperatures and rainfall, soil quality and disease ecology

to measure the impact of geography on economic growth (Hall and Jones 1999; Easterly and Levine 2003; Rodrik et al. 2004).

Others (Easterly and Levine 2003; Rodrik et al. 2004) found no effect of geography on growth after controlling for institutions. Rodrik et al. (2004) for example demonstrated that the quality of institutions[25] was far more important than geography and international trade in determining income levels. Rodrik et al. (2004) demonstrates that once institutions are controlled for, international trade has no direct effect on incomes while geography, has at best weak direct effects. Rodrik et al. (2004) however do not suggest that this establishes the unimportance of international trade and geography in influencing income levels.

The second key conclusion is that productivity rather than factor accumulation may be the driving force behind growth performance. This is borne out in several seminal studies. The Solow model, which first sought to explain long-term trends in economic growth, was found to leave a large unexplained residual, suggesting that capital and labour accumulation alone do not fully explain growth (Limam and Miller 2004).

Growth accounting analysis generally assumes that this residual, termed the Solow residual, captures total factor productivity (TFP). TFP is simply the improvements in the efficiency with which the capital and labour inputs are used. By defining capital to include physical and human capital, Mankiw (1995), finds results that are closer to neo-classical theoretical predications (Limam and Miller 2004).

Romer and Lucas's endogenous growth theory considers the effect of variables such as trade, human capital and endogenous technology on output growth and the different mechanisms of technology diffusion. A key finding was that the sources of TFP growth differ between developed and developing countries. Technological innovations provide the main source of TFP growth in developed economies while developing countries face the challenge of acquiring and absorbing foreign technology

[25] Rodrik et al. (2004) focused on the role of property rights and rule of law when evaluating institutions.

(Limam and Miller 2004). Hence, it is the innovation and absorption components of TFP growth that determine cross-country differences in income growth rates.

Helpman's (2004) review of the empirical literature on international knowledge spill-over finds positive evidence: that is, less-developed countries do benefit from foreign stock of knowledge. However, the output gain in industrial countries is larger. Helpman concludes, therefore, that investment in innovation in developed countries leads to divergence of income levels between the poor and rich.

Total factor productivity or 'something else' as Easterly and Levine (2001) put it when referring to the residual, and not factor accumulation, is what accounts for the most of the income and growth differences across nations. Easterly and Levine, however, do not argue that factor accumulation is unimportant in general nor that it is not critical at specific junctures.

HIGH PERFORMING EAST ASIAN ECONOMIES

The interesting question is: which of the above two conclusions of the empirics of the determinants of growth can explain the economic performance of East Asia. It is argued by many that the second conclusion that TFP growth is the main driver of economic growth is more relevant to explaining the growth performance of East Asia though that view is contradicted by some.

For example, few authors have argued that the 'East Asian Miracle' [26] was built simply on capital accumulation and that productivity growth played a minimal role (Young 1992; Krugman 1994). A counter-view to Krugman (1994) and Young's (1992) hypothesis, is that these economies grew spectacularly because of their capacity to generate new ideas, put them into practice and to develop new skills and learn to use efficiently, imported technology was advanced by Romer (1993). In an examination of the factors that contributed to the faster economic growth among the East Asian

[26] The term 'miracle' was used by the World Bank (1993) in a comprehensive assessment of the East Asian growth experience. This was discussed in the preceding chapter.

economies relative to other economies in the Asia Pacific Economic Cooperation (APEC) group, Drysdale and Huang (1997) found that TFP growth was an important factor in explaining the rapid growth in the East Asian economies while the findings of Han et al. (2004) were that the TFP growth and technical efficiency of the East Asian economies were normal when compared to developed economies but that their input growth was the main contributor to rapid economic growth.

These contrasting arguments were investigated by Nelson and Pack (1999). In their study of the growth literature relating to the East Asian economies, they identified two strands of thinking. The first strand was the technology assimilation interpretation. This interpretation stresses entrepreneurship, innovation and learning aspects, which were encouraged by favourable domestic policies. It argues that these economies had to go through this investment in learning before they could master the new technologies that they were adopting from developed economies. This view saw human and physical capital as a necessary but insufficient condition for growth.

The second strand was the accumulation theory which argues the converse. It suggests that it was the massive investment in human and physical capital that was driving growth. Nelson and Pack conclude that the rapid growth in East Asian economies was indeed driven by TFP, identifying a major change in the structure of the economies including shifts in the size of firms and the sectors of specialisation that was associated with rapid economic growth. Nelson and Pack (1999) conclude that the 'marshalling of inputs' did contribute to part of the story but, more importantly, it was the entrepreneurial capabilities, and the emphasis on innovation and learning by doing that were facilitated by appropriate institutions that is the big part of the story.

THE KEY ROLE OF INSTITUTIONS

The key findings points to the importance of institutions as deep determinants of long term economic growth. The literature demonstrates clearly that although proximate factors are important to driving growth, institutions matter most significantly. This is

clear in the East Asian case. If only human and capital accumulation explained economic growth (as per Krugman's 1994 argument), or getting the macroeconomic environment right, then the lesson for other countries would be simple: raise the levels of investment and ensure macroeconomic stability. However, this has not been the case in many countries. The East Asian economies also paid close attention to institutions that promoted entrepreneurship, learning by doing and innovation, and social stability above and beyond the two principles stated earlier. Institutions therefore function as the meta-structure within which other factors are able to function. Challenges related to managing society, trade, geography, human capital (entrepreneurship, ideas, and innovation) and investment in factors of production — physical and technological —can be mitigated or overcome by appropriate institutional structures.

These two findings provide a framework to analyse the circumstances in which Malaysia finds itself. The literature review noted that regime type did not matter to economic performance. What mattered to economic growth was political stability and Malaysia is a politically stable country, having not experienced any regime change since it gained independence. Its competitive authoritarian regime (Levitsky and Way 2002)[27] is widely credited to have delivered on economic growth, wealth distribution and political and social stability (World Bank 1993; CGD 2008).

Despite the success noted above, productivity in Malaysia is on a downtrend trend while Malaysia's human capital and technological capacity and capability are mediocre at best despite significant investments into physical and human capital. This raises the question of the efficacy of Malaysia's institutions. Why are Malaysia's institutions not capable of addressing the middle-income trap? What are the significant differences between the institutions in Malaysia and the successful East Asian Tigers?

[27] Levitsky and Way (2002) defines competitive authoritarianism as authoritarian regimes that rely on formal democratic institutions as the principle means of obtaining and exercising political authority. The incumbent regime however violates the basic norms of democracy often and to such extent that the regime fails to meet conventional minimum standards for a democracy. There is consensus that Malaysia is a competitive authoritarian regime, in that Malaysia is not a liberal democracy, but neither is it authoritarian.

The literature review also noted that high income inequality and ethnic-religious-cultural-linguistic fragmentation can lead to weak social capital and/or to governments that develop poor institutions which then negatively impact on economic growth. Interestingly, these ethnic-religious-cultural-linguistic fragmentations are important factors where there is a significant difference between the successful East Asian Tigers and Malaysia. Could these factors – the ethnic-religious-cultural-linguistic fragmentation in Malaysia – be the deep determinants that have influenced the efficacy of the political, economic and social institutions in Malaysia? And could it be that these institutions have contributed to Malaysia's weak human capital development and high income inequality?

CONCLUSION

This chapter provided a review of the literature on the theories of economic growth. The review focused on three key issues: the transformation of the growth literature from a focus on 'factor accumulation' to the 'deep structural determinants' of growth; what these growth theories say about long run economic growth; and the role of institutions in the growth process. A key interest is how this theory might apply to the case of Malaysia.

The literature review suggests three important findings that inform this research. First, there is currently no unified economic growth theory to adequately explain the growth phenomenon. This has led researchers to rely on partial theories and frameworks to explain the role of various factors in determining economic performance and growth. Theories such as neoclassical economics, endogenous growth theory, the new trade theory, the new economic geography, new institutional economics, and evolutionary economics, are some ways in which economists have tried to explain economic growth. The various empirical strategies employed have also led to differing conclusions. This provides strong support for a research approach that uses a combination of economic

theories and approaches to investigate the challenges that Malaysia is facing in overcoming the middle-income trap.

The second important finding is that institutions broadly defined to include all forms of social-economic-political and cultural constructs, matter in determining incomes and growth rates. These factors influence combine in different ways to influence political stability which matters for economic growth. Societies with high social capital contribute positively to economic growth, and the converse in societies with weak social capital. Regimes, either democratic or non-democratic, can achieve economic growth, if there is political stability.

The third important finding is that productivity growth and not factor accumulation alone may be a main driving force behind growth performance. In the East Asian Tigers, institutions that promoted the entrepreneurial capabilities and the emphasis on innovation and learning by doing were instrumental in driving this productivity growth.

These three key findings provide the framework within which this research undertakes further analysis on Malaysia's economic circumstance. This literature review identifies the possibility that ethnic-religious-cultural-linguistic fragmentation can lead to weak institutions and poor economic policies, which then leads to weak economic growth.

Chapter 3 discusses institutions more comprehensively and seeks to identify an appropriate research strategy to answer the issues that have been raised.

Chapter 3 Institutions, human capital development and income inequality

> How do we account for the persistence of poverty in the midst of plenty? If we knew the source of plenty, why don't poor countries simply adopt policies that make for plenty?...We must create incentives for people to invest in more efficient technology, increase their skills and organise efficient markets. Such incentives are embodied in institutions.
>
> North (2002, p.3)

Institutions are like a black box and are often not defined but taken as a given. This chapter has three objectives: to identify a suitable definition for institutions; to identify a schema within which to classify institutions; and to identify an appropriate method to measure them. This threefold set of objectives is important in developing a framework that can meaningfully explain the role of institutions in contributing to Malaysia's current human capital development and income inequality outcomes. This is relevant in identifying suitable and feasible reform measures.

DEFINING AND CLASSIFYING INSTITUTIONS

Chapter 2 identified the importance of institutions in long term economic growth. Despite the importance of institutions in economic growth, the challenge in analysing the impact of institutions on economic growth derives from the inability to define what institutions are. Some of the basic difficulties come from the complexity in identifying the focal point of analysis. Is it the rules and regulations, the organisations, the actors, or particular behaviour or a combination of these factors in which interest lies (Djelic 2010)? The functions of institutions themselves are complex. An institution could be serving more than one function and at the same time many institutions could be serving the same function. Conversely the same function could be served by different

institutions in different societies or in different time periods (Chang 2006). This complexity is also experienced in Malaysia[28].

There are three major perspectives on institutions. The first is the disciplinary perspective (for example sociology, political science and economics); the second an epistemological or conceptual perspective (for example rational choice, historical or cultural); and the third a geographical perspective (such as the German or the American school) (Djelic 2010). In general, the institutional perspective across the various disciplines begins with the basic recognition that human activities, including economic activities, are embedded and framed within larger institutional schemes and tends to be stable (Djelic 2010). Since, human activities are at the core of institutions, then 'what' constraints and incentivises human activities can be defined as institutions. In this logic, North's (1991) widely used definition of institutions as 'the rules of the game in society' is most appropriate. North defines institutions as:

> ...the humanly devised constraints that structure political, economic and social interaction. They consist of both information constraints (sanctions, taboos, customs, traditions, and codes of conduct) and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity.
>
> North (1991, p. 97)

This definition provides the broadest possible conceptualisation of what institutions are. By defining institutions to include formal and informal constraints and incentives, North (1991) effectively includes all aspects of human activity, be it in the field of economics, socio-cultural and political institutions such as religion, culture and political systems and their impact on economic growth into the analysis.

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[28] There is sufficient literature both praising and deriding Malaysia's leaders, organisations and policies. The Commission of Growth and Development (2008) and the World Bank (1994) are examples of reports praising Malaysia, while the works of KS Jomo and E.T. Gomez are indicative of the literature that highlights Malaysia's leadership, institutional and policy weakness and failures.

Using North's definition allows the research to incorporate all aspects of the deep determinants that relate to institutions that were highlighted in Chapter 2. This ranged from regime type or system of government, organisations and government policies and the interaction of religion, culture, ethnicity and language of the key stakeholders on them – that eventually has an impact on economic growth. Religion, culture, ethnicity and language are particularly important as it appears that Malaysia differs significantly in these characteristics from the successful East Asian Tigers.

North's definition however does not fully address the challenge of institutional analysis for identifying the links between institutions and their impact on economic growth. Undertaking analysis on institutions requires analysis at multiple levels. This challenge is partly resolved by Hollingsworth's (2000) mapping of institutions as set-out in Table 7. As noted, an important characteristic of institutions is their persistence and its stability. One way then of classifying or organising institutions is to rank them in terms of their resilience or resistance to change. Hollingsworth (2000) does precisely this. Theoretically, each of the components in the various levels is related. For example, rules, markets, education system, ministries, schools, statutes and sectoral performance are all different types of institutions and are inter-related. The ability to reform these different components differs depending on their resilience or resistance to change. Changing a statue or an administrative decision is much easier than changing a rule. Hollingsworth organises these components in a descending order of stability or permanence. The components at higher levels are more permanent and durable, while those at lower levels change more rapidly.

Table 7 Institutional levels and components of institutional analysis

Institutional level	Components
Level 1 – Institutions	Norms; rules; conventions; habits and values;
Level 2 – Institutional arrangements	Markets; states; corporate hierarchies; networks; associations; communities;
Level 3 – Institutional sectors	Financial system; system of education; business system; systems of research
Level 4 – Organisations	Entities in civil society and public and private sectors e.g. firms; government departments; ministries; schools; non – governmental organisation
Level 5 – Outputs and performance	Statutes; administrative decisions; the nature, quantity and the quality of industrial products; sectoral and societal performance

Source Hollingsworth, (2000).

At the first level, there are the basic norms, rules, conventions, habits and values of a society. These are the most fundamental properties of institutions and are the most enduring and resistant to change. Most human activity is organised and regulated by norms and rules and systems of rules, both formal and informal (Burns and Dietz 2001). The components in level 1 are the most important as they exert the greatest influence on the components at the next four levels. The approach undertaken in this research argues that norms, rules, habits, conventions and values both reflect and shape the preference of actors. These Level 1 institutions influence and determine 'who' and 'what' are included in different types of decision making (Shepsle 1986; 1989). Although it is recognised that there is heterogeneity in the 'rules of the game' (institutions) at the different levels of institutions and that this may vary from situation to situation, there are meta-rules and norms which encompass all other lower level rules or situations.

This schema is useful as it allows for the identification of where the actual institutional reforms have been made in the hierarchy of Malaysia's institutional architecture and where despite attempts to reform, have stalled. The schema also allows the research to undertake specific institutional analysis relating to human capital development and income inequality. Finally it provides a context in terms of the limits to institutional reforms in Malaysia. Plausible reasons for these limits can then be explored. The identification of these limits is critical as implementing successful

institutional reforms requires a thorough understanding of where the strongest challenges will arise against the proposed reforms.

ANALYSING AND MEASURING INSTITUTIONS

This research undertakes an analysis of institutions at two levels to answer the research questions posed and, in particular, to examine the challenges posed by Malaysia's racial, religious and cultural diversity. The analysis of institutions at the first level examines the impact of institutions on the macroeconomic performance of the economy. The analysis of institutions at the second level investigates the links of institutions regulating a single factor of production – human capital – in the manufacturing sector. The analysis of the effect of institutions on human capital in the manufacturing sector in this research is limited to a discussion on Malaysia's formal public education and training system.

Chapter 2 surveyed the literature on the theory and empirics of the links between institutions and economic growth. The literature surveyed highlighted the challenges in modelling this link. The process of integrating institutions and institutional change into economic theory is still in its infancy and most attempts are less than satisfactory (Tao Kong 2007). Moreover, the growth literature does not subscribe to one overarching definition of economic, political or social institutions, their process of change, and their likely channels of influence on economic outcomes (Aron 2000).

To address these challenges, the empirical literature on economic growth uses a wide range of indicators to capture the various aspects of institutions. This includes including institutional quality (for example the enforcement of property rights), political stability (for example the frequency of riots, coups or civil wars), characteristics of political regimes (for example how free and fair elections are, how liberal is the constitution, and how strong are executive powers), social capital (the extent of civic activity and organisations), and social characteristics (differences in income and in ethnicity, languages spoken, religious, and historical background). Some of these

indicators reflect processes, while others capture performances. These indicators also differ in terms of quality of coverage, both geographically and temporally (Quibria 2006).

The character of these institutional indicators can be divided into two categories. The first are the objective measures of institutions or governance such as (i) measures of political instability and violence and (ii) political institutions. Relevant databases for this category are the Polity Database and the Database of Political Institutions and Political Constraints Index (Williams and Siddique 2008). The second are the subjective measures of institutions. This category includes (i) Freedom House index of civil and political liberties and (ii) International Country Risk Guide (ICRG). There are also many other political risk ratings such as Business Environment Risk Intelligence (BERI) and Business Monitor International (BMI) (Williams and Siddique 2008).

Researchers often rely on several of these types of individual indicators to capture the features of institutions although each has a potentially different channel of influence on growth. Suffice it to say that all these definitional and empirical challenges make modelling institutions and institutional change highly complex and difficult. This research does not attempt to model institutions and institutional change except in analysing the links between institutions and economic output at the macroeconomic level in Chapter 4. All of the empirical strategy is based on standard neoclassical theory which is discussed comprehensively within the chapters in which it is utilised.

The Worldwide Governance Indicators (WGI) is used as the measure for institutional quality in Chapter 4. The WGI consists of six composite indicators of broad dimensions of governance covering over 200 countries since 1996. The six composite indicators are: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. These six composite indicators are based on approximately 150 different indicators that are obtained from 31 different data sources, capturing governance perceptions as reported by survey respondents (experts and non-experts),

non-government organisations, commercial business information providers and public sector organisations worldwide.

It is also important to recognise that governance is different from institutions. If institutions are defined as the 'rules of the game' then governance is the 'rules for the rulers within the rules of the game.'

The WGI definition of governance has three key elements:

> ...the traditions and institutions by which authority in a country are exercised. This includes (a) the process by which government are selected, monitored and replaced; (b) the capacity of the government to effectively formulate and implement sound policies; and (c) the respect of citizens and the state for the institutions that govern economic and social interactions among them...

Two measures of governance are constructed to correspond to each of the three areas, resulting in the six composite indicators.

Table 8 Industrial development patterns and human capital profile

Governance area	Key indicators
The process by which governments are selected, monitored and replaced	(1) Voice and accountability (VA) – capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and free media. (2) Political stability and Absence of Violence/Terrorism (PV) – capturing perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
The capacity of the government to effectively formulate and implement sound policies	(3) Government effectiveness (GE) – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. (4) Regulatory quality (RQ) – capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
The respect of citizens and the state for the institutions that govern economic and social interactions among them	(5) Rule of Law (RL) – capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts as well as the likelihood of crime and violence. (6) Control of Corruption (CC) – capturing perceptions of the extent to which public power is exercised for private gain,

	including both petty and grand forms of corruption, as well as 'capture' of the state by elitist and private interests.

Source World Governance Indicators, (2012).

The WGI have been criticised from several standpoints (Arndt and Oman 2006; Thomas 2007; Langbein and Knack 2009; Kurtz and Scharank 2007). These various critiques can be organised into four major categories (Kaufmann et al. 2010; Carmen 2009). The first is the usefulness of the WGI or the aggregation methodology used; the second are the various 'sorts of biases' in the individual indicators underlying the WGI, the third concerns the independence of the assessment of governance provided by different data sources, and finally identifying the causality between governance and growth.

The authors of the WGI have responded by explaining that the usefulness of the WGI stems from the fact that (a) they provide a very broad country coverage, greater than that provided by any individual data source on governance; (b) by averaging information from many different data sources, the WGI is able conveniently to summarise the existing information on governance; (c) by averaging, the WGI also smoothens out some of the inevitable idiosyncrasies of individual measures of governance. This allows the WGI to be more informative about the broad notions of governance that they are intended to measure than any individual data source; and (d) the estimates of governance are accompanied by explicit margin of errors that transparently indicate the unavoidable degree of uncertainty associated with measuring governance by any means (Kaufman et al. 2010).

This research uses the WGI for three reasons. First, measuring institutions is still imperfect. Each institutional measure has its strengths and its weaknesses. Several of the critiques of the WGI indicators are also equally applicable to other indicators that attempt to measure institutional quality and institutional change. Second, the WGI is a long standing research project to develop cross-country indicators of governance that is constantly improving the method of its measurements. It is also accepted as an industry benchmark (Quibria 2006). Thirdly and most important, the WGI meets one of the key

objectives of this research, which is to identify a suitable method to measure the impacts of institutions on economic output at the macroeconomic level. This is necessary to identify the type of institutions that matter at the different levels of income. These results can provide some measure for Malaysia to focus on improving institutional quality in specific areas as it faces the middle-income trap.

INSTITUTIONS IN HUMAN CAPITAL DEVELOPMENT AND INCOME INEQUALITY

The second level of institutional analysis undertaken here is at the sectoral level in the manufacturing sector, focusing on human capital. As an economy industrialises and incomes start to rise, it will experience structural change and ideally, as a response, industries move up the value chain. This involves upgrading technological levels, which exerts demand for more skills, for higher skills and for different types of skills. Institutions in turn evolve to meet this demand for more, higher, and different types of skills. Lall (1999) provides a general description of the evolution of institutions; the demand for human capital and technological capabilities as the pattern of industrial development and the structure of the economy changes as set-out in Table 9. Lall's (1999) exposition provides us with an overview of the required institutions and the required human capital development at the various stages of industrial development, and the attendant technological level.

Table 9 Industrial development patterns and human capital profile

Level/Pattern of industrial development	Human capital/skills profile	
	Skills	Technological capabilities
Low levels, mainly simple assembly and processing activity	Literacy, simple technical and managerial training. Practically no in-firm training except informal on-job learning	Ability to master assembly technologies, copy simple designs, repair machines, but many activities operate well below world best practise levels of technical efficiency
Intermediate level, with export-oriented activities in light industry, some local linkages in low-tech products	Good secondary and technical schooling and financial management training. Low base of engineering and scientific skills. In house training mainly by export oriented enterprises. SMEs have low skill levels	World class assembly, layout, process engineering and maintenance in export oriented industries. In other, capability to undertake minor adaptations to processes and products. Little or no design/development capabilities. Technology institutions weak.
Deep industrial structure but mainly inward oriented; technological lags in many activities	Broad but often low quality schooling, vocational and industrial training. Broad engineering base. In-house training lagging. Management and marketing skills weak. SMEs have some modern skills	Process mastery of capital and skill intensive technologies but with inefficiencies. Considerable backward linkages. Significant adaptation of imported technologies. Little innovation, low linkages with universities and technology institutions.
Advanced and deep industrial structure, with many world-class activities, own design and technology base	Excellent quality schooling and industrial training. High levels of university trained scientists, engineers and managers. Training institutes responsive to industrial needs. Large investment in formal and informal in-firm training. SMEs have high skill levels and competence.	Ability to monitor, import and adapt state of art advanced technologies. Good design and development capabilities in sophisticated technologies. Deep local linkages with suppliers, buyers, consultants, universities and technology institutions.

Source Lall, (1999).

The role of educational and training institutions, research and development institutions, firm networks and labour markets will change concurrently through the different stages of development as the demand for skills changes (ADB 2004). As an example, at low-income levels, the education and training system focuses on providing

the basic education and low level skills. As the economy moves to middle-income levels, the focus is on delivering universal secondary education, the deepening of vocational and technical education particularly at post-secondary technical level. The up-skilling and retooling of the labour force is also given emphasise through life-long learning. When countries achieve high-income levels, education and training institutions focus on delivering labour force with higher education especially in science and engineering. There are also high rates of social learning with strong linkages between universities, specialised R&D agencies and firms in the economy.

A developed economy will have most of its labour force and therefore its human capital, within the skilled workforce category. However developing countries that are transitioning from middle-income to high-income face several challenges in creating the demand for knowledge; for the provision of education and training for knowledge and the creation of effective demand for this skilled labour, for several reasons discussed below.

The provision of education and training is vulnerable to collective action and coordination problems. Two specific conditions give rise to this problem. The first relates to the public good nature of knowledge. Outcomes from education and training have certain public good characteristics. Once these outcomes are produced, those who have not paid for them are not easily excluded from benefitting from this investment. Furthermore, many skills are generic rather than firm specific, and as such are transferable. Although such skills are important for the efficient allocation of labour across industries which leads to economy wide efficiency gains and improved labour mobility, it often leads to firms under-investing because of the risk that a free riding firm will poach the worker once he/she has been trained (Booth and Snower 1996). State interventions in market institutions in cases such as these are necessary as the social returns exceed the private returns (Arrow 1962).

The second aspect of the public good nature is that the generation of human capital requires investment in learning institutions such as schools, technical and

vocational colleges, universities and institutions that specialise in research and development. In developing countries there is an added imperative of acquiring frontier technologies, the knowledge of these technologies and disseminating the knowledge to local firms to enable them to catch up. This raises a collective action challenge. Institutions can play a critical role in acquiring these technologies and making them publicly available to speed up the learning process (Gerschenkron 1962). Korea and Taiwan are said to have raised the availability and quality of human capital and shortened the learning the learning experience of developed Western economies and Japan through institutional interventions (Johnson 1987; Amsden 1989; Wade 1990).

Thirdly, the demand for skilled labour is positively correlated with firm level innovation (World Bank 1997; Zeufack 1999) and a firm's knowledge assets are positively associated with firm level innovation (Thornbill 2006). Private agents are unlikely to participate in market-driven activities when the risks involved are not matched by commensurate returns. This includes investing in employee training and R&D initiatives. This has important implications to tacit and implicit knowledge and the demand for skilled labour. Given the tacit and spontaneous nature of a number of entrepreneurial actions, formal contracts can never be exhaustive and hence will always involve moral hazards.

There is a considerable body of literature that has demonstrated how a systemic framework with a blend of influence from markets and social capital (trust and loyalty) have been instrumental in driving productive networks of industrial synergies (Rasiah and Lin 2005). Social capital (trust and loyalty) then becomes a critical mode of governance to ensure that entrepreneurial synergies are expanded rather than contracted.

This social capital is best engendered through formal integrated cluster networks (Rasiah 2002; 2005). The term 'cluster' refers to a network of inter–connected firms, institutions and other organisations that enjoy systemic links from integrated coordination relationships. The synergy created and appropriated in industrial districts depends on the strength of clustering and the presence of these institutions.

Agglomeration of firms enjoying strong network cohesion between them and institutions are likely to offer greater flexibility in the use of human capital, knowledge and technology, and market synergies than those of individual firms.

Fourthly, there may be various imperfections in the factor markets that lead to sub-optimal levels of human capital. These could be labour market imperfections such as: (i) the presence of transaction costs caused by matching and search frictions; (ii) the presence of asymmetric information such as that between the employer and worker, between current employer of the worker and other firms in the economy, and between workers and educational and training providers about the quality of training; and (iii) capital market imperfections caused by credit constraints or when workers are uncertain about future wages; and (iv) various policies that alter the supply and demand of labour in the manufacturing sector.

These challenges of developing human capital and technological catch-up are exacerbated further by Malaysia's political system. Malaysia is classified as an electoral authoritarian state (Levitsky and Way 2002). Regime types as discussed, does not matter to economic growth but political stability does. Malaysia's ruling coalition is essentially a distributional coalition that represents the main ethnic groups in Malaysia (Ritchie 2005). This ruling coalition has provided stability through both repressive and responsive measures (Crouch 1996). The repressive measures included harsh treatment of labour (Ritchie 2005; Kuruvilla 1995; 1996). Conventional literature suggests that the ruling coalition had ensured stability to a large extent: (1) by significant amount of social spending (especially in the areas of health, education and infrastructure); (2) by ensuring that the interests of the majority ethnic indigenous community (the Bumiputeras in general but the Malays in particular) that were economically backward were met through extensive affirmative action policies and control of the political system; and (3) by guarantying the rights of the different minority ethnic groups were not curtailed excessively through these extensive affirmative action policies through a

relatively liberal economic and cultural system (Athukorala and Menon 1997; Faaland et al. 2003; Ragayah 2011).

The institutional analysis undertaken in this research explores the interaction between the distributional coalition with policy outcomes in the area of human capital development and addressing income inequality and its impact of manufacturing sector performance.

CONCLUSION

This chapter had undertaken three important tasks that have laid the groundwork for the framework to undertake the institutional analysis to address the research questions. Firstly, this chapter identified North's (1991) widely used definition of institutions as 'the rules of the game in society'. Secondly, the chapter recognised that undertaking institutional analysis requires analysis at multiple levels. Hollingsworth's (2000) mapping of institutions according to their resistance to change was identified as a suitable way of classifying, organising and subsequently analysing institutions. Finally, the chapter also identified the WGI as the most suitable set of indicators to measure the quality of institutions at the macroeconomic level.

This research undertakes analysis of institutions at two levels. First, at the macroeconomics level, this research will analyse the impact of institutions on the macroeconomic performance of the economy. The WGI is utilised in this analysis which is undertaken in Chapter 4. Second, the analysis of institutions is undertaken at the sectoral level, and more specifically, the manufacturing sector. The discussion is centred around the nature and the challenges that institutions regulating education and training faces in the provision of education and training in general, but more specifically, research and development institutions, firm networks and labour markets in relation to human capital development, technological upgrading and addressing income inequality in the manufacturing sector. The chapter also identified that these challenges are exacerbated by the nature of Malaysia's political system which institutionalises

ethnically based distributional coalition. All of these taken together, sets-up the framework that is used in explaining the outcomes of Chapters 5 and 6. Chapter 8 extends the institutional analysis using Hollingsworth (2000) schema to explain possible root causes of the outcomes in Chapters 4, 5 and 6. Chapter 4 discusses the links between institutional quality and economic output.

Chapter 4 Institutions that matter: a comparative analysis

> Little else is required to carry a state to the highest degree of opulence from the lowest barbarism, but peace easy taxes and tolerable administration of justice; all the rest being brought by the natural course of things.
>
> Adam Smith (1776, cited in Bhattacharya 2006, p. 16).

There is growing agreement on the influence of the various types of institutions on economic growth at the different stages of development and levels of income. In this chapter, the relationship between institutional quality (measured by the governance indicators) and economic performance (measured through selected macroeconomic variables) for a broad sample of countries from all income levels over the period 1990 to 2008, is investigated. The objective here is to determine the influence of the various types of institutions on economic growth across the different country income levels.

THE HYPOTHESIS

Chapter 2 suggested that a useful distinction between proximate causes and deep determinants of economic growth. The proximate causes of growth are accumulation of both tangible and intangible factors of production and productivity (how effectively these factors of production are combined to produce outputs). The deep determinants of growth are the underlying main factors that determine the rate of factor accumulation and productivity. Chapter 2 also argued that institutions, more than any other deep determinant, contributed significantly although not exclusively to economic growth. Chapter 3 provided the definition, classification and some appropriate ways for measurement of institutions that can be applied in this research.

Building on the findings of Chapters 2 and 3, this chapter tests the hypothesis that poor quality or weak institutions should on average be associated with lower

economic performance.[29] The chapter also investigates whether different types of institutions matter at the different levels of income.

There are three possible channels via which poor quality institutions can affect economic performance. The first channel is through dysfunctional aspects of institutions acting as a tax on productive activities and therefore reducing the amount of production that accrues to productive units. This would not only provide a disincentive to accumulating productive resources but also to using those resources intensively, and results in lower productivity. Corruption, political violence and instability are examples of these 'taxes'. These institutional characteristics are a form of tax because they increase the risk associated with economic activity and have the effect of reducing the returns on investments and production.

The second way in which poor quality institutions may result in lower efficiency is by providing an incentive to divert effort away from productive activities. As illustration, weak rule of law that results in widespread theft or expropriation constrains agents to invest in the protection of their property. Similarly, an ill-designed regulatory framework may encourage agents to spend resources in trying to take advantage of the loopholes in the protection of intellectual property rights through litigation instead of trying to innovate. Likewise, if the government is ineffective or unpredictable, agents will find it more profitable to devote time and effort to rent-seeking activities. Depending on the rest of the institutional framework; rent-seeking appears either in the guise of lobbying or corrupting activities that can often be viewed as the two sides of the same coin.

Thirdly, mal-functioning institutions may encourage the accumulation of unsuitable production factors. Henisz (2000) for instance argues that political risk results in the accumulation of generic[30] instead of specific, and therefore more efficient, capital. As the argument goes, generic capital has an option value because it can be

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[29] Economic performance here means the actual performance relative to potential performance (Armstrong et al. 2011). This concept is derived from the production literature and is explained in detail in the method section.

[30] Generic and specific capital relate to the type or specificity of the technology or assets that are used by a firm in its production process. Specific capital is more costly than generic capital although it will increase the competitiveness of the firm (Henisz 2000).

more easily reallocated to other purposes if, for instance, when the government suddenly cancels a license that had previously been attributed. Bad institutions, moreover, may slow down the diffusion of new ideas and technologies, especially if they inhibit foreign investment as Wei (2000) or Harms and Ursprung (2002) suggest.

Nevertheless, counter arguments also exist. Some claim that less democratic regimes may be instrumental in initiating and implementing development. China and Malaysia stand out as illustrations of this line of reasoning. As suggested in Chapter 2, empirical work does not provide unmitigated evidence that democracy is associated with higher growth. Among the list of high-income economies, are several less democratic regimes such as Singapore, Saudi Arabia, the United Arab Emirates and so on as set-out in Table 52.

It can also be argued that corruption may raise efficiency in a country plagued with a desperately slow and inefficient bureaucracy. This 'grease the wheels hypothesis', where corruption is used to lubricate the stiff wheels of rigid government administration, was put forward by Leff (1964) and Huntington (1968) and later by Schleifer and Vishny (1994). Although it has not received much support in the recent empirical literature, it cannot be dismissed on a priori grounds. More importantly, it can also be argued that permissive intellectual property rights might facilitate and speed up technology transfers.

An inference from this literature is that different institutions matter at different levels of income. There are reasons for remaining cautious about the a priori relationship between institutions and economic performance. Although the main contention is that poor quality institutions hamper efficiency, qualified results should not come as completely surprising. Through empirical testing, a more definitive answer as to how the relationship between institutions and economic performance works can be gauged.

THE METHOD

The main objective here is to test the relationship between institutions and economic performance and to rank the performance of Malaysia in relation to

comparable economies over a period of time, in order to explain how this changes over time and explain why it does. Studies of long run economic performance are focusing increasingly on institutions (political, economic and social) as an explanatory of long run economic growth. This fits in with the broad argument that economic growth is no longer considered to be linear or gradual, involving the inevitable transformation from self-sufficiency to specialisation or from low-income to high-income (Helpman 2004). Instead, economic growth follows the creation and evolution of institutions that support social and commercial relationships (Klien and Luu 2002) and the ability to mitigate external shocks. Within the framework of this research, institutions that help to achieve this promote economic growth.

Institutions facilitate growth by reducing the potential hazards to economic transactions (trade and/or commercial relationships) such as shirking, opportunism, predatory behaviour, risks, and the like. This is done through institutions that enforce secure property rights, reliable procedures for resolving disputes and the ability to enforce contracts in the absence of close social ties. These institutions reduce information costs, encourage capital formation and mobility, allow risks to be priced and shared and facilitate cooperation (North 1990; Drobak and Nye 1997; Levine 1997). In particular, political authorities must make credible commitments not to expropriate private resources once investments are made successfully (Furobotn and Richter 2010; North 1991).

Despite widespread agreement that institutions matter, there is no consensus on how institutions should be incorporated into analysis or what model to use, as discussed in Chapters 2 and 3. The current approach in the growth literature is eclectic in nature. Different researchers have their own preferences, dependent on the theory, which they deem important.

In terms of model specification, growth theories are usually built on either the neoclassical models or endogenous growth models and their extensions. The approach here is slightly different and analyses the relationship between institutions and overall economic performance by appealing to production literature. This research models economic performance using a stochastic frontier approach following the production

literature. Stochastic frontier analysis is a sophisticated way to benchmark performance of productive units. It analyses economic units – firms or nations – by identifying 'best practice' and evaluating each economic unit's performance relative to the best practice frontier. The results produce not only rankings of the quality of all economic units but also numerical measures of performance that can be used to assess the effects of various policies or characteristics.

Another reason why the stochastic frontier approach is used is because of its ability to differentiate between under performance per se and random events that impact on performance. Traditionally, cross-country empirical analysis based on neo-classical economics has assumed the efficient use of inputs (Kalirajan and Shand 1999). This assumption that economic units are always efficient implies that actual output is the maximum attainable output given available inputs and that all economic units are equally productive for a given level of input and technology. In reality, economic units may use technology with varying degrees of efficiency (Bos et. al 2010).

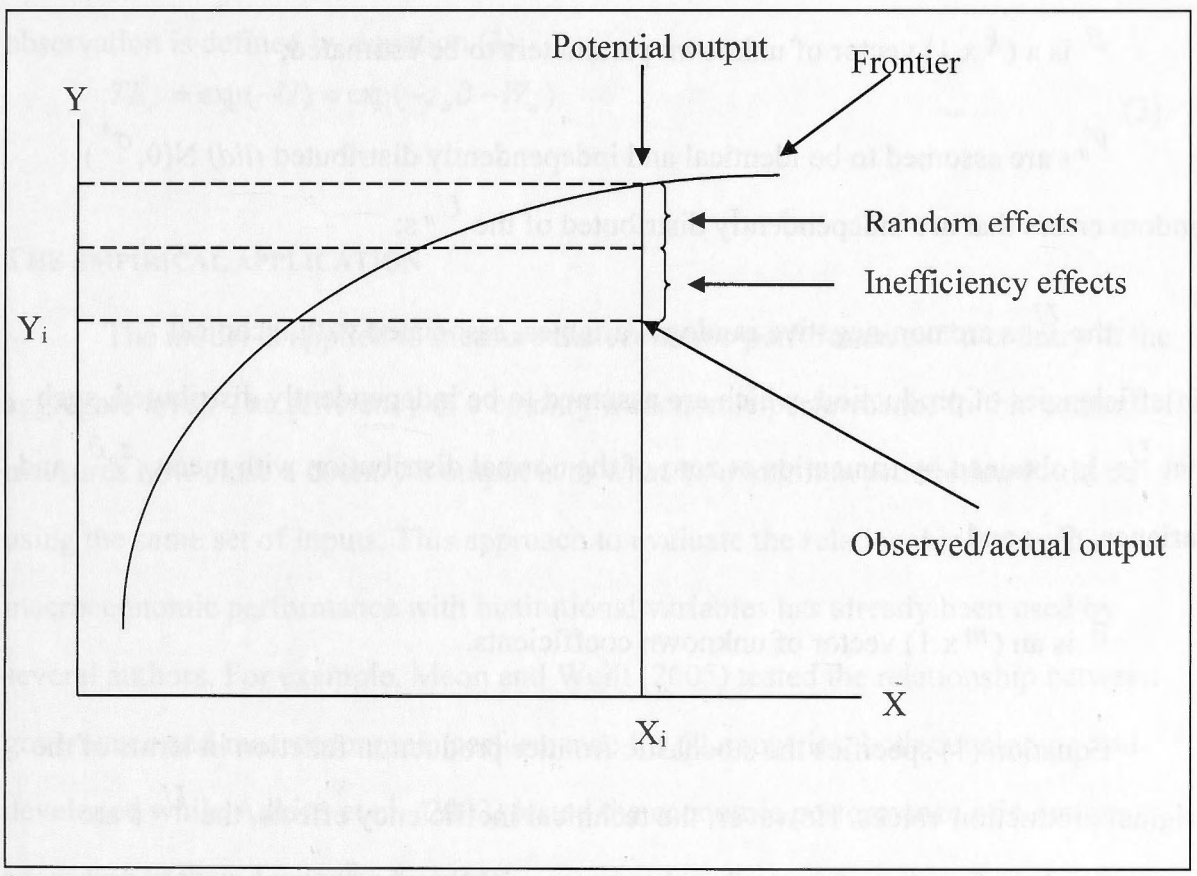
The stochastic production frontier analysis was first introduced independently by Aigner, Lovell and Schmidt, and Meeusen and van den Broeck in 1977 (Kalirajan and Shand 1999). They note that in the production literature, 'the production process is subject to two economically distinguishable disturbances, with different characteristics'. The error term is therefore 'composed' into a non-negative term that captures production inefficiencies and a more conventional symmetric error term, which captures random disturbances. The ability to differentiate the disturbance terms allows differentiation between inefficiency and random events (Armstrong 2009).

This ability to differentiate the disturbance terms and hence measure inefficiencies has several important implications. Firstly, the inefficiency measures facilitate comparisons across economic units within a dataset and indicate relative efficiency. Secondly, where the inefficiency reveals variations, further analysis can be undertaken to identify the factors causing these variations. Thirdly, these analyses can identify policy implications (Kalirajan and Shand 1999).

Figure 4 below presents the key concepts of the stochastic frontier approach. A production frontier is estimated with the stochastic frontier, providing a benchmark for

each economic unit regardless of its inputs. This benchmark is named as he potential output in the literature. Then, the inefficiency is computed by comparing the potential output with the observed or actual output. This measurement can then be termed the efficiency score of the particular economic unit.

Figure 4 The efficiency frontier



Source Adapted from Kalirajan and Shand, (1999).

THE MODEL

The basic model follows the stochastic frontier[31] model specified for panel data by Battese and Coelli's (1995). This is written as:

$$Y_{it} = \exp(x_{it}\beta + V_{it} - U_{it}) \qquad (1)$$

[31] The stochastic frontier approach in this study associates efficiency with respect to the 'intercept' only and not in the use of specific factors of production. It is however recognised that in practice, the role of institutions may vary in the utilization of specific factors of production (p. 62-63). In this context, the varying stochastic frontier maybe used (Kalirajan and Obwana, 1994).

Where Y_{it} denotes the production at the t-th observation ($t = 1,2,...,T$) for the i-th economic unit ($i = 1, 2,\ldots, N$);

x_{it} is a (1 x k) vector of values of known functions of inputs of production and other explanatory variables associated with the i-th economic unit at the t-th observation;

β is a (k x 1) vector of unknown parameters to be estimated;

V_{it} s are assumed to be identical and independently distributed *(iid)* N(0, σ_v^s) random errors that are independently distributed of the U_{it} s;

the U_{it} s are non-negative random variables, associated with technical (in)efficiencies of production, which are assumed to be independently distributed, such that U_{it} is obtained by truncation at zero of the normal distribution with mean, $z_{it}\partial$, and variance, σ^2; and

∂ is an (m x 1) vector of unknown coefficients.

Equation (1) specifies the stochastic frontier production function in terms of the original production values. However, the technical inefficiency effects, the U_{it} s are assumed to be a function of a set of explanatory variables, the z_{it} s and an unknown vector of coefficients, ∂.

The technical inefficiency effect, U_{it}, in Equation (1) is specified in Equation (2) as:

$$U_{it} = z_{it}\partial + W_{it} \qquad (2)$$

Where the random variable, W_{it}, is defined by the truncation of the normal distribution with zero mean and variance, σ^2 such that the point of truncation is $W_{it} \geq -z_{it}\partial$.

The method of maximum likelihood is proposed for simultaneous estimation of the parameters of the stochastic frontier and the model for the technical inefficiency effects and the likelihood function is expressed in terms of the variance parameters,

$\sigma_S^2 \equiv \sigma_v^2 + \sigma^2$ and $\gamma \equiv \sigma^2 / \sigma_S^2$.

The technical inefficiency of production for the i-th economic unit at the t-th observation is defined by equation (3):

$$TE_{it} = \exp(-U) = \exp(-z_{it}\partial - W_{it}) \tag{3}$$

THE EMPIRICAL APPLICATION

The model is applied to measure the economic performance of a country at the aggregate level. The efficiency of a country's economic performance in this context, measures how close a country's output is to what its maximum production could be using the same set of inputs. This approach to evaluate the relationship between macroeconomic performance with institutional variables has already been used by several authors. For example, Meon and Weill (2005) tested the relationship between governance and macroeconomic performance for 62 countries, both developing and developed while Adkins et al. (2002) tested the economic performance of countries according to their economic freedom.

Chapters 2 and 3 identified that physical and human capital accumulation, while being a necessary condition, without consideration of productivity, is insufficient in explaining long term growth. To analyse this, the models use output per worker to represent productivity and capital per worker and human capital per worker to capture physical and human capital accumulation. These models also assume a constant returns-to-scale Cobb-Douglass production technology. This kind of model can then be rewritten as:

$$\ln\left(\frac{Y}{L}\right)_i = \beta_0 + \beta_1 \ln\left(\frac{K}{L}\right) + \beta_2 \ln\left(\frac{H}{L}\right) + v_i - u_i \tag{4}$$

Where: $i = 1, 2, \ldots, x$, indexes countries;

$\left(\frac{Y}{L}\right)_i, \left(\frac{K}{L}\right)_i, \left(\frac{H}{L}\right)_i$ are respectively output per worker, capital per worker,[32] and human capital per worker;

v_i is a random disturbance reflecting measurement errors and σ_v^2 u_i is an inefficiency term, capturing inefficiencies relating to governance, trade openness, geographical location and ethno-linguistic fragmentation.

In the present study institutions are seen as crucial to ensuring economic and productivity growth as institutions determine how well factors of production are used.

Institutional variables are captured by an index of the quality of governance and are modelled in the inefficiency equation in the following manner:

$$u_i = \partial_0 + \partial_1 latitude_i + \partial_2 ELF_i + \partial_3 openness + \partial_4 governance_i + W_i \quad (5)$$

Where u_i is country i's inefficiency;

W_i is the random variable defined by the truncation of the normal distribution;

Latitude, Openness and *Fractionalisation* are control variables described below; and

Governance is the relevant index of governance.

The introduction of control variables is a natural robustness check of the simple bivariate relationship between governance and efficiency. The model uses three control variables which have been identified as deep determinants of growth in the literature: geography, and trade. Race and religion per se is discarded as a deep determinant as it does not stand empirical scrutiny. Instead social capital, which measures the cohesiveness of a society, is selected as an institutional variable, as it has been demonstrated to affect economic growth. Higher religious, cultural, linguistic and ethnic fragmentation has negative direct and indirect effects on economic performance and the

[32] As noted, (K/L) is the capital stock per worker or it can be stated differently as the investment per worker (p. 70). Capital stock is measured using gross capital formation on fixed assets (p. 72). Investment rates for developing countries, especially for the High Performing East Asian (HPEAs) economies are often much higher than in developed economies in relation to their GDPs. However this investment rate includes investment into human capital often in the provision of education and training (non-asset based investment) (p. 73). Hence, there is a difference in capital per worker and investment per worker.

quality of institutions (Okediji 2010). Chapter 2 reviewed the literature analysing the impact of heterogeneous societies on economic performance. To measure social capital, an index of ethno-linguistic fractionalisation (ELF) is used as a proxy. The ELF measures the probability that two randomly selected individuals will not belong to the same ethno-linguistic group. Higher values of the ELF correspond to greater levels of fractionalisation. The index takes on a value between 0 and 1, where 0 indicates high ethnic homogeneity and 1 indicates high ethnic heterogeneity. The ELF index in this study is taken from Okedji (2010).

Geography is proxied by latitude. A negative correlation between distance from the equator and growth has been repeatedly observed. The reason for this is most likely due to widespread disease in the tropics. Chapter 2 noted that the geography theory argues that the tropics carry with it several geographical burdens which impact negatively on growth (Sachs et al. 1999, 2001 and 2004; Diamond 1997).

The third deep determinant is trade or economic openness. Openness to trade is proxied by the ratio of trade to GDP. The relationship between trade and growth is unsettled although there is near consensus about the theory of the positive association between trade flows and growth in the economics profession (Yanikkaya 2003). However, the evidence is mixed with some finding that openness may be significantly and positively related to productivity and productivity growth (for example, Edwards 1998) with others finding the converse (for example, Rodriguez and Rodrik 2001).

The influence of the six different indices of governance is tested on economic performance at the aggregate level. Six efficiency frontiers are computed so that the information on the relationship between governance and economic performance for each index of governance are available for further analysis. Next, the presence of all governance variables is included in the model to test them against each other and to allow for comparison. All the governance variables are also tested for countries in three different income levels: (i) OECD economies; (ii) upper middle-income economies and (iii) lower middle-income and low-income economies to examine the influence of income levels on the relationship between governance and efficiency.

The Frontier 4.1c software by Coelli (1996) is used to perform the maximum likelihood estimation of the stochastic frontier model.

THE DATA

The macroeconomic data is from the World Development Indicators dataset. The measurement for output (Y) is gross domestic product based (GDP) on purchasing power parity (PPP). These data are in constant 2005 international dollars.

Capital (K) is measured using gross capital formation which consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. The data are in constant 2000 U.S. dollars.

Total labour force (L) comprises people age 15 and older who meet the International Labour Organisation's (ILO) definition of the economically active population: all people who supply labour for the production of goods and services during a specified period.

Human capital (H) is proxied through educational attainment which is a measure of the average number of years of schooling in the working-age population over 15 years old which is similar to the ILO definition. This index had been computed by Barro and Lee (2000) and updated up to 2010.

The focus is on the period from 1990 to 2008. This period is chosen for two main reasons. Firstly, the measurement of governance indicators began only in 1996 and is available biannually up to 2002 (that is, for 1996, 1998, 2000 and 2002), after which it is available annually. The governance indicators for 1996 are utilised for the period 1990 to 1996, the 1998, 2000 and 2002 measures are used for that year and also the prior year.

Secondly, there has been a significant downtrend in Malaysia's growth performance since the East Asian Financial Crisis (EAFC) of 1997/98 especially when it is compared to the period 1990-96. One of the causes of the EAFC is argued to be weak governance (Wilson and Drysdale in Drysdale 2000). By testing the period from 1990 to 2008, this study will be able to see if there have been significant changes in efficiency in Malaysia since the EAFC and if governance is a key influence.

The sample has 101 countries from all income levels. The descriptive statistics of the sample are displayed in Table 10.

Table 10 Summary statistics for non-governance variables

Variable	Mean	Std Dev	Min	Max
Output per worker (ln Y/L)	9.571	1.147	6.69	12.01
Capital per worker (ln K/L)	7.181	1.547	2.48	10.34
Human capital per worker (ln H/L)	1.977	0.425	- 0.11	2.55
Latitude	20.533	28.394	-44.28	64.15
ELF	.428	.282	0	.98
Openness	60.176	32.294	7.99	192.12

Note Y/L, K/L and H/L are output per worker, capital per worker and human capital per worker

The analysis requires quantitative estimates of the quality of institutions to test the relationship between institutional quality and performance. Since institutional quality cannot be measured entirely in an objective manner, the quantitative indicators are measured through subjective evaluations. Chapter 3 discussed the suitability of the various measurements of institutional quality and identified the Governance Indicators as the most appropriate for our needs.

Chapter 3 noted that the qualitative evaluations that form the basis of the governance indicators, come either through experts commissioned to assess the quality of a country's governance or through surveys of residents carried out through profit or not-for-profit enterprises. Naturally these evaluations suffer from two common drawbacks. Firstly, as these indicators are by construction subjective, they may be biased. Secondly, they may not be comprehensive and maybe limited to a select number of countries.

These shortcomings were addressed by Kaufmann et al. (1999a; 1999b; 2010) by building composite indices that combined indicators developed by the two groups using a method termed the 'unobserved component model.' This method allows the biases of individual indices to partly cancel out each other. Furthermore, as the Kaufmann composite indices aggregate several other indices, they provide data for a wider sample of countries, allowing one index to fill the gaps left by others.

The Kaufmann governance indicators are classified into six clusters, creating six composite indices which measure a particular dimension of governance. They range

from -2.50 to +2.50[33] with higher values reflecting better quality of governance. These indicators capture the essence in how institutions facilitate economic growth.

The first pair of indicators refers to the process of 'selection of the authority' and therefore measures aspects of governance that have been the focus of the literature devoted to the impact of democracy and political stability. This indicator therefore provides an assessment of political risk in a country.

i. Voice and accountability (VA) captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media;

ii. Political stability and absence of violence (PV) measures the perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including domestic violence and terrorism;

The second pair of indicators assesses the soundness of a country's policies and the quality of the administration as well as how free the economy is. This pair of variables is termed as 'government action.'

iii. Government effectiveness (GE) captures perceptions of the quality of public service, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies;

iv. Regulatory quality (RQ) captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development;

The final pair of indicators focuses on the assessment of the way in which a country's citizens feel bound by the countries legal framework embodied in its constitution. This pair is termed as 'respect for institutional framework.'

v. Rule of law (RL) captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of

[33] The estimate for governance range from approximately -2.5 (weak governance) to 2.5 (strong governance) performance but there are anomalies, usually for countries suffering extreme violence, when the point estimates exceed the range. The standard errors reflect the variability around the point estimates.

contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence; and

vi. Control of corruption (CC) captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.

Table 11 Summary statistics for governance variables

Variable	Mean	Std Dev	Min	Max
VA	0.172	0.932	-1.95	1.83
PV	-0.004	0.921	-2.57	1.58
GE	0.217	1.018	-1.66	2.24
RQ	0.272	0.825	-2.21	2.01
RL	0.144	1.004	-1.88	1.96
CC	0.120	1.072	-1.79	2.47

Before the results of the stochastic frontier (SF) computations are discussed, the expected signs, based on theory, of the bivariate relationships between output per worker and each of the explanatory variables utilised in this research are noted. Table 12 provides a summary of the expected signs.

Table 12 Summary hypothesis of the expected signs of the selected variables

Explanatory variable	Expected sign	Explanation
ln K/L	+	The higher the capital per worker, the higher the productivity
ln H/L	+	The higher the human capital per worker, the higher the productivity
Fractionalisation	-	The higher the ethno-language fractionalization, the lower the productivity.
Latitude	+	The further from the equator, the higher the productivity.
Openness	+/-	In theory, the more open the economy, the higher the productivity although empirical evidence is not definitive.
VA	+	The higher the voice and accountability, the higher the productivity although empirical evidence is not definitive.
PV	+	The less the incidence of political violence, the higher the productivity.
GE	+	The higher the government effectiveness, the higher the productivity.
RQ	+	The higher the regulatory quality, the higher the productivity.
RL	+	The higher the adherence to the rule of law, the higher the productivity.
CC	+	The higher the control of corruption, the higher the productivity.

A visual inspection of the bivariate relationship between these variables and output per worker provides the expected outcomes. The scatter plots matched against fitted values[34] do support the hypothesised relationships although it is not unambiguously clear for all bivariate relationships. Most importantly, at this stage, it is also unclear what the direction of causality is.

THE RESULTS

The results of the stochastic frontier analysis when only one governance indicator is included in the inefficiency model are produced in Table 13, Table 14 and

[34] Refer to Appendix 1, Figure 20 to 30.

Table 15 while Table 16 summarises the results for selected governance variables alone. Table 17 sets out the results when all governance indicators are used jointly as explanatory variables in estimating the inefficiency model. Table 18 estimates the inefficiency for (a) the Organisation of Economic Development Countries (OECD) – 31 countries; (b) Upper middle-income economies – 26 countries, and (c) lower middle-income and low-income economies – 44 countries. A minus sign in the inefficiency equation indicates that an increase in the explanatory variables causes a reduction in inefficiency or a rise in efficiency.

The control variables are first analysed. Latitude always has the correct sign and is significant in all six models demonstrating that the further an economy is from the equator, the better its economic performance. Nevertheless, its explanatory power on efficiency when holding all other variables constant in all models is less than one per cent. This supports Rodrik et al. (2004) views that when institutions are taken into account, geography loses its importance as a major influence on efficiency. The ELF variable is counter-intuitive as it is wrongly signed in all the models with the exception of model three. However, it is significant in all models with the exception of model one and three. It is counter-intuitive as it suggests that an increase in ethnic-linguistic fractionalisation will improve performance. This requires further investigation. Openness is the least conclusive. It is statistically insignificant in all models except in model two. Furthermore, its coefficient values in most cases were zero or close to zero.

Table 13 ML determinants of the stochastic production function and the determinants of technical efficiency: Results for the 'selection of the authority' variables

Variable	VA		PV	
	Coefficient	t-ratio	Coefficient	t-ratio
Intercept β_0	7.112	49.306*	6.419	47.432*
ln K/L β_1	0.415	38.593*	0.475	48.733*
ln H/L β_2	0.110	3.146*	0.109	3.164*
Inefficiency Intercept δ_0	0.916	10.974*	0.539	6.015*
Latitude δ_1	-0.007	-10.134*	-0.006	-10.378*
ELF δ_2	-0.017	-0.270	-0.120	-1.868**
Openness δ_3	-0.001	-1.152	0.001	2.256*
Variable of interest δ_4	-0.378	-12.957*	-0.208	-10.900*
Sigma2 σ^2	0.359	29.344*	0.391	29.169*
Gamma γ	0.101	1.867**	0.001	0.160

Note Significant at the 1, 5 and 10 per cent levels are denoted respectively by *, ** and ***.

Table 14 ML determinants of the stochastic production function and the determinants of technical efficiency: Results for the 'government action' variables

Variable	GE		RQ	
	Coefficient	t-ratio	Coefficient	t-ratio
Intercept β_0	8.137	50.313*	7.046	43.795*
ln K/L β_1	0.303	19.243*	0.421	38.847*
ln H/L β_2	0.113	3.466*	0.108	3.099*
Inefficiency Intercept δ_0	0.930	10.912*	0.935	8.594*
Latitude δ_1	-0.009	-9.370*	-0.007	-10.317*
ELF δ_2	0.090	1.015	-0.091	-1.398***
Openness δ_3	0.000	0.283	0.000	-0.297
Variable of interest δ_4	-0.802	-14.436*	-0.394	-14.569*
Sigma2 σ^2	0.454	17.503*	0.364	27.129*
Gamma γ	0.646	13.290*	0.049	1.143

Note Significant at the 1, 5 and 10 per cent levels are denoted respectively by *, ** and ***.

Table 15 ML determinants of the stochastic production function and the determinants of technical efficiency: Results for the 'respect for institutional framework' variables

Variable	RL		CC	
	Coefficient	t-ratio	Coefficient	t-ratio
Intercept β_0	7.249	44.859*	6.971	60.352*
ln K/L β_1	0.403	32.254*	0.429	41.908*
ln H/L β_2	0.101	2.959*	0.107	3.194*
Inefficiency Intercept δ_0	0.885	9.133*	0.878	15.917*
Latitude δ_1	-0.006	-9.526*	-0.008	-11.838*
ELF δ_2	-0.102	-1.567***	-0.221	-2.714*
Openness δ_3	0.000	0.911	0.000	0.696
Variable of interest δ_4	-0.390	-13.642*	-0.376	-17.266*
Sigma2 σ^2	0.358	28.821*	0.343	29.699*
Gamma γ	0.087	1.356***	0.013	0.649

Note Significant at the 1, 5 and 10 per cent levels are denoted respectively by *, ** and ***.

All the governance indicators, the variables of interest, are correctly signed and are statistically significant at the 1 per cent level. This suggests that all governance indicators are important. It can be concluded from this bivariate relationship that a rise in the overall quality of institutions is associated with using factor endowments of a country more efficiently. Among the governance variables, GE has the strongest impact on efficiency followed by RQ, RL, VA, CC and PV. Therefore the pairing of 'government effectiveness' is more important that the 'selection of the authority' and 'respect for institutional framework' in determining efficiency.

Table 16 ML determinants of the stochastic production function and the determinants of technical efficiency: Summary results for relationship between output per worker and individual governance indicators

Variable	Coefficient δ	Sigma2 σ^2	Gamma γ
(1) VA	-0.378 (-12.957)*	0.359 (29.344)*	0.101 (1.867)**
(2) PV	-0.208 (-10.9)*	0.391 (29.169)*	0.001 (0.16)
(3) GE	-0.802 (-14.436)*	0.454 (17.503)*	0.646 (13.29)*
(4) RQ	-0.394 (-14.569)*	0.364 (27.129)*	0.049 (1.143)
(5) RL	-0.39 (-13.642)*	0.358 (28.821)*	0.087 (1.356)***
(6) CC	-0.376 (-17.266)*	0.343 (29.699)*	0.013 (0.649)

Note Absolute t-statistics are displayed in parentheses. Significant at the 1, 5 and 10 per cent levels are denoted respectively by *, ** and ***.

In the seventh model, all governance variables are included to test them against each other. The results for the control variables are correctly signed but ELF and openness are not significant. Once again, GE demonstrates that it has the most important impact on the efficiency of an economy. This is followed by VA, CC, RL and PV. RQ was statistically insignificant. Gamma is also statistically significant at the 1 per cent level and has the value 0.703. This implies that approximately 70 per cent of the variation across countries during this time period is due to inefficiencies.

Table 17 ML determinants of the stochastic production function and the determinants of technical efficiency: Estimation with all governance variables

Variable	Coefficient	t-stats
Intercept β_0	8.409	60.520*
ln K/L β_1	0.272	20.736*
ln H/L β_2	0.105	3.531*
Inefficiency Intercept δ_0	1.057	14.360*
Latitude δ_1	-0.013	-13.025*
ELF δ_2	0.052	0.708
Openness δ_3	-0.001	-1.040
VA δ_4	-0.480	-10.731*
PV δ_5	0.143	3.882*
GE δ_6	-0.573	-9.888*
RQ δ_7	-0.002	-0.031
RL δ_8	0.281	4.496*
CC δ_9	-0.425	-10.919*
Sigma2 σ^2	0.437	19.772*
Gamma γ	0.703	20.023*

Note Significant at the 1, 5 and 10 per cent levels are denoted respectively by *, ** and ***.

When the governance indicators were tested against each other in different country groupings, the results were altogether different, as reported in Table 17. Human capital was not significant in the OECD and upper middle-income economies and significant at the 90 per cent level for low-income economies. Latitude was not significant for upper middle-income economies while openness was not significant for OECD economies. ELF was significant but wrongly signed.

All governance variables are significant except RQ and CC for OECD economies. A very strong relationship between governance indicators and efficiency was observed for low-income economies. Almost 95 per cent of variations in low-

income economies are explained by inefficiencies compared to only 29 per cent for upper middle-income economies and 36 per cent for OECD economies. RL was most important for OECD economies while GE was most important to upper middle- and low-income economies.

This suggests that institutions impact on economies differently at different levels of income. For example, CC was insignificant for OECD economies but very important for low-income economies but the reverse was true for RL. One possibility is that, once all variables are included, some of the variables lose their importance as reflected by GE in OECD economies.

Table 18 ML determinants of the stochastic production function and the determinants of technical efficiency: Estimation with all governance variables for different economies classified by income

Variable	OECD	UMIE	LIE
Intercept β_0	10.562 (68.28)*	9.227 (88.408)*	6.938 (67.415)*
ln K/L β_1	0.036 (3.414)*	0.101 (8.658)*	0.329 (27.491)*
ln H/L β_2	0.039 (0.751)	0.025 (0.985)	0.055 (1.568)***
Inefficiency Intercept δ_0	0.966 (5.296)*	0.254 (2.059)**	-2.896 (-7.418)*
Latitude δ_1	0.007 (3.537)*	0.001 (0.382)	-0.104 (-22.554)*
ELF δ_2	-0.454 (-1.543)**	-0.568 (-3.703)*	-2.049 (-6.495)*
Openness δ_3	0.001 (0.914)	-0.002 (-1.767)**	-0.053 (-28.855)*
VA δ_4	0.762 (3.321)*	-0.201 (-2.364)**	-2.535 (-15.277)*
PV δ_5	-0.189 (-1.637)***	0.309 (5.315)*	1.515 (9.386)*
GE δ_6	-0.386 (-3.091)*	-0.729 (-6.165)*	-2.386 (-9.669)*
RQ δ_7	0.165 (0.870)	0.308 (3.003)*	0.418 (2.369)**
RL δ_8	-1.125 (-4.26)*	-0.596 (-4.078)*	0.920 (2.929)*
CC δ_9	-0.019 (-0.436)	0.648 (5.633)*	-2.212 (-12.354)*
Sigma2 σ^2	0.064 (8.842)*	0.070 (10.704)*	2.555 (22.529)*
Gamma γ	0.357 (5.147)*	0.289 (3.688)*	0.944 (139.073)*

Note Absolute t-statistics are displayed in parentheses; OECD – Organisation for Economic and Cooperation Development; UMIE – Upper middle-income economies; LIE – Lower middle-income and low-income economies.

MALAYSIA

Malaysia's aggregate economic efficiency improved from about 45 per cent of its potential in 1990 to 61 per cent of its potential in 2008. In the sample of 101 economies, Malaysia ranked 44 in 1990 and improved to 37 in 2008 in terms of relative efficiency as illustrated in Figure 5. This might have been expected given Malaysia's position as upper income economy. It also indicates that there is room for further improvement and that significant reforms will be needed to graduate to a high-income economy.

Malaysia's performance in respect of the governance indicators is moderate recording performance within the range of -0.6 to 1.2. It scored the lowest in 'Voice and Accountability' and highest in 'Government Effectiveness.' This is not surprising. Malaysia is classified as less democratic but a successful one. In Chapter 2 it was noted that regime type did matter for economic growth, but rather political stability. A major reason for Malaysia's success is that the regime[35] has achieved political and social stability and this enabled economic growth.

The East Asian Financial Crisis (EAFC) appears not to have impacted on Malaysia's economic efficiency as it continued to improve over the period. Also, despite deterioration in the 'Control of Corruption' and stagnating performance in all other indicators, with the exception of GE, Malaysia economic efficiency continued to improve. These fit certain arguments that deterioration in the control of corruption and in the rule of law does not impact on economic efficiency. However, if Malaysia wants to graduate to being a high-income economy, it may need to improve several aspects of its governance, as the indicators that influence OECD economies are different from those of upper- and middle-income economies.

There is also cause for concern that while Malaysia ranks as expected in terms of economic performance, it ranks poorly in terms of human development index for its income level as set-out in Table 52. The quality of Malaysia's institutions and their governance may have contributed to this.

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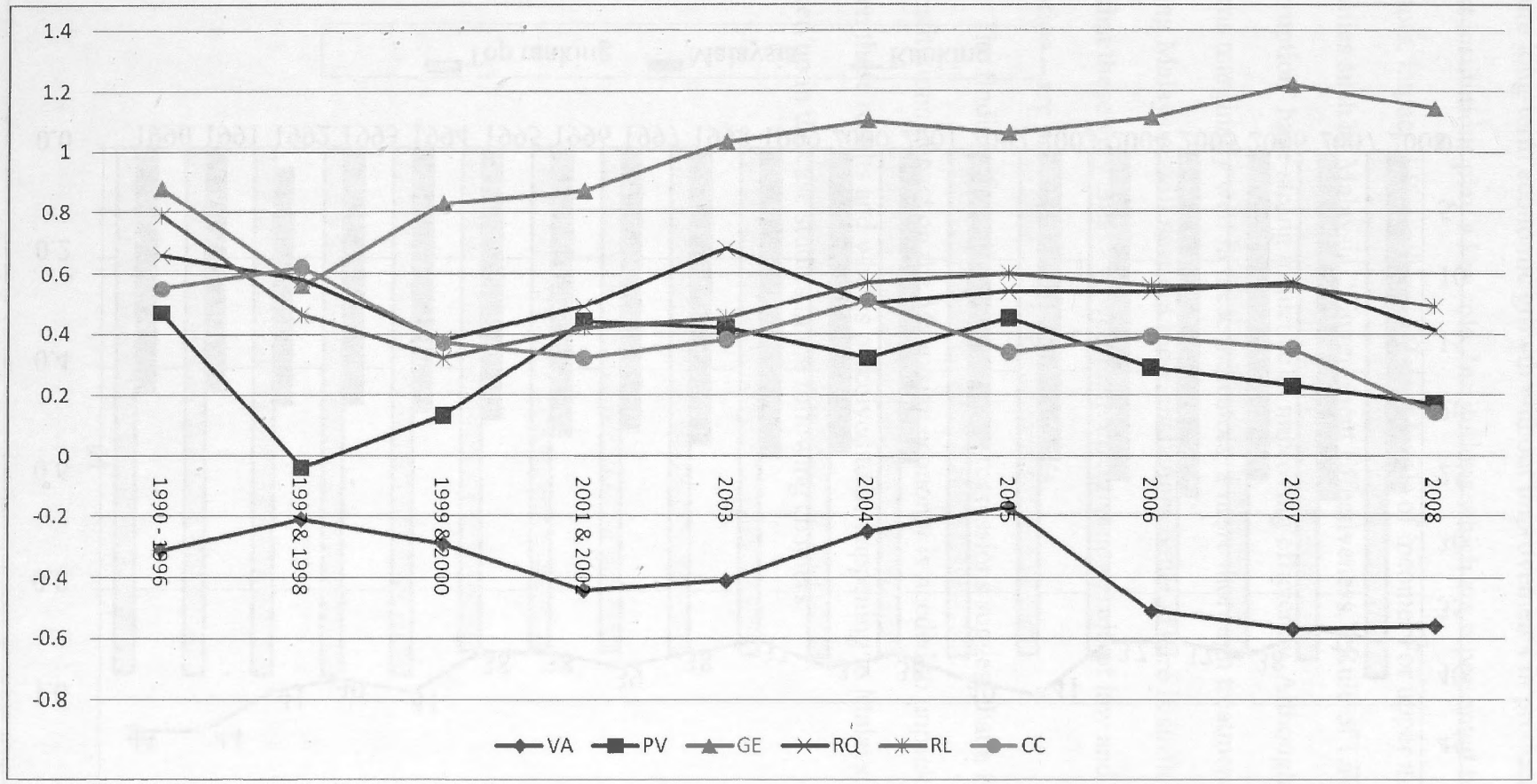
[35] As noted in Chapter 2, Malaysia is classified as an 'electoral authoritarian regime' (Levitsky and Way 2002).

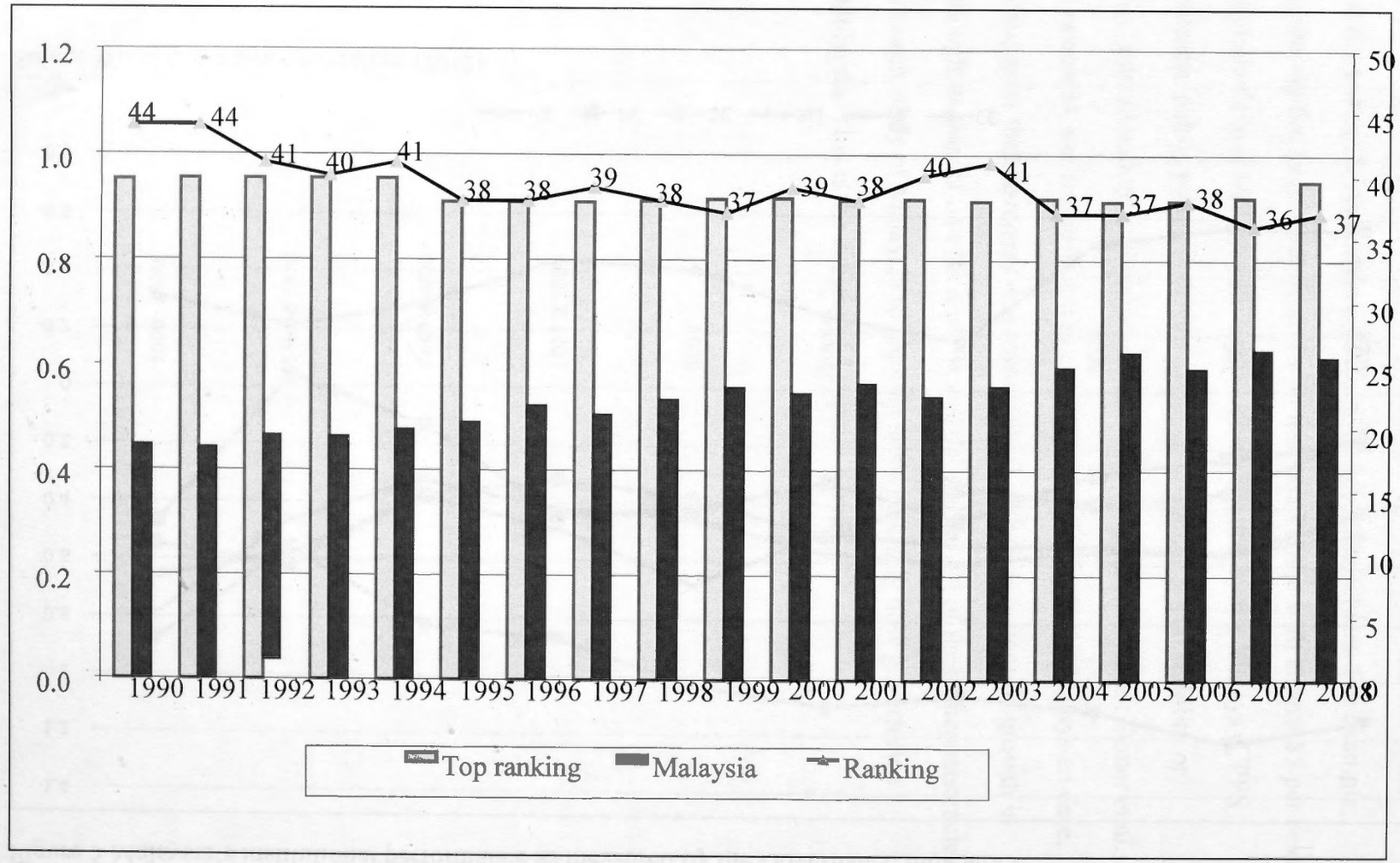
These results call for further in-depth investigation of the Malaysian case and of factors which may have been missed in the cross-country regressions to identify more thoroughly how governance has impacted on economic outcomes. For example, ethno-linguistic fractionalisation was incorrectly signed in the cross-country regressions. However, in the Malaysian case, the literature suggests that ethnic fraction has led to precisely the situation that has been put forward in theory – which it has led to the ruling regime rewarding its supporters especially its key stakeholders. For example, Malaysia has among the largest public sector in the Asia Pacific with almost 85 per cent of the elite diplomatic and administrative services dominated by the Malays (CPPS 2006). Furthermore public policy is driven primarily to ensure social stability or 'national unity' considerations and not economic efficiency (Ritchie 2005; Doner et al. 2005). Also, openness was insignificant in many of the models. In the Malaysian case, the literature suggests that openness was instrumental in driving economic growth in Malaysia although its impact on efficiency is still debatable. All of these inconsistencies warrant a thorough study of Malaysia to identify more precisely how governance impacts on Malaysia. This is the subject of Chapters 5 and 6.

Figure 5 Malaysia's institutional performance as measured by the Governance Indicators



Source World Governance Indicators, (2012).

Figure 6 Malaysia's efficiency performance, 1990-2008


1.2
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1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008
Top ranking
Malaysia
Ranking

CONCLUSION

This chapter focused on demonstrating the importance of institutions in improving the efficiency of the way in which factors of production are employed to produce outputs. Physical and human capital accumulation alone will not be sufficient to ensure long-term economic growth without improvements in productivity. In this context institutions play a key role. Institutions which are represented by the governance indicators, impact differently at different levels of income. For upper middle-income economies such as Malaysia, 'Government Effectiveness,' 'Rule of Law' and 'Control of Corruption' have strong influence in improving efficiency. Although Malaysia performs marginally well in these indicators, a more thorough treatment of issues affecting Malaysia, will bear out these challenges better. There is sufficient evidence to argue that these very areas – government effectiveness, rule of law and control of corruption – are problematic areas in Malaysia.

The findings from the cross-country regressions suggest that a further study of how institutions impact on the Malaysian economy is needed to unpack inconsistencies between these results and what is perceived to be happening in Malaysia. These issues are taken up in the case studies in the following chapters.

Chapter 5 Human capital development and its contribution to manufacturing sector performance

> The human capital situation in Malaysia is reaching a critical stage. The rate of outward migration of skilled Malaysians is rising rapidly [and] the education system is not producing the skills demanded by firms.
>
> NEAC (2010a, p. 6)

Human capital is one, if not the most important, determinant of economic growth. Educational institutions and training systems have a significant impact on the quality and quantity of human capital that exists in an economy. This chapter investigates the contribution of the different levels of human capital along with other factors of production on manufacturing sector output. The study suggests that Malaysia's manufacturing sector continues to rely on unskilled labour which has a dampening impact on technology adoption, despite government intervention to move the sector up the value chain. The findings of this chapter provide the basis for the institutional analysis of human capital development in Chapter 7.

INTRODUCTION

Chapter 1 had identified the literature which argued that Malaysia was caught in a middle-income trap. This brings with it a set of challenges for policymakers. Some of the features that differentiate growth beyond middle income growth from low income to middle income are clear. As it attempts to transition into a high income economy, Malaysia's output growth should become more capital and skill intensive. The domestic market should expand and become a more important engine of growth, especially through the growth of services. With higher growth, wages should start to rise, most rapidly for highly skilled workers, and labour shortages are likely to emerge (Kohli et al. 2011). Thus, increasing the stock and the flow of skilled human capital is therefore imperative in overcoming the middle-income trap and also sustaining the economic growth in the economy.

Rapid technological change has increased the demand for workers with higher skills and/or education everywhere. The *World Employment Report 1998-99* notes:

> In both developed and developing countries, employment of skilled workers has been on the rise… The rate of growth of employment in the period 1981 – 1996 in advanced countries has usually been highest for professionals and technicians… In developing countries too, this occupational category has witnessed a high growth rate, though one less disproportionate to other categories in comparison to developed countries. In contrast, the rate of growth of employment for the production and related workers category (which contains skilled manual and craft workers but mainly unskilled and semi-skilled) has been very low, often negative for developed countries. In the developing countries for which data are available, with some exceptions (e.g. The Philippines), this group has witnessed much lower employment growth than the highly educated and trained group of professionals and technicians.
>
> ILO (1998, p. 32)

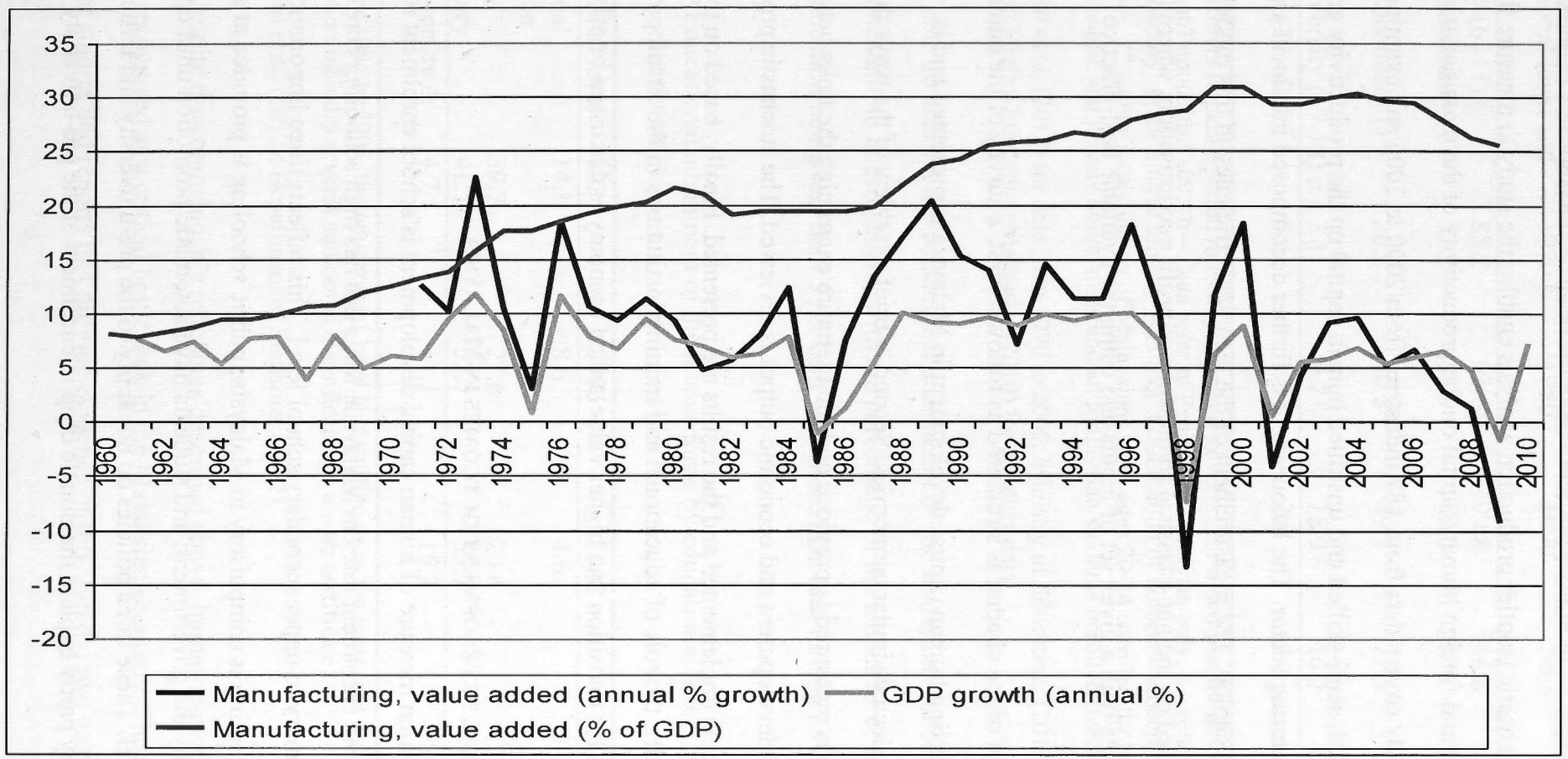
This phenomenon is also observable in the newly industrialising East Asian economies (ADB 2011). Due to the intensification of competition from labour surplus economies such as China, India, Indonesia and Vietnam, upper middle income economies with tight labour markets, such as Malaysia, have sought to further restructure their economies to produce more skill- and capital- intensive goods and services. This has created significant skills shortages and mismatches as the workforce try to upgrade skill levels to meet the demand (Thangavelu and Hu 2006). The inability to develop sufficient skilled human capital is identified as one of the reasons for Malaysia as being stuck in a middle income trap or not being able to transform and transition into a high income economy (Ohno 2009; Kohli et al. 2011; NEAC 2010a). It is also argued that the acute skills shortages and mismatches in Malaysia are exacerbated by a unique factor: affirmative action policies that favour the majority Malay race (World Bank 2011b; Woo 2009).

Human capital is one of the key drivers of economic growth. The development of human capital contributes fundamentally to drive the structural changes and maintaining the competitiveness of domestic industries (Lall 1999). This chapter examines the development of human capital and the institutions that underpin it by exploring the human capital constraints in the economy as it transitions towards a higher

value added activities. This is done by exploring the contribution of human capital to the performance of the manufacturing sector. The chapter makes an important contribution to the understanding of human capital development and economic growth of Malaysian economy. It measures the impact of labour at the different skills levels to the manufacturing sector's performance. The analysis also differentiates the local human capital from foreign human capital. It is believed that this chapter is the first to account for the productive performance of local and foreign human capital in the Malaysian manufacturing sector. The chapter also discusses the importance of institutional developments in education as one of drivers of human capital as the economy transits to higher value-added activities. The findings of this chapter also provide the basis for the institutional analysis on human capital development in Malaysia undertaken in Chapter 7.

The manufacturing sector provides an interesting case study of the impact of human capital on the Malaysian economy for three important reasons. First, the manufacturing is a leading sector in the Malaysian economy. Rapid expansion of the manufacturing sector has been the key driver of economic growth in Malaysia (Yusuf and Nabeshima 2009). Second, the manufacturing sector has been in a declining trend in output growth since the 1997/98 East Asian Financial Crisis (EAFC) as illustrated in Figure 7. Manufacturing value added as a percentage of GDP has declined from the all-time high of more than 30 per cent just before the East Asian financial crisis to about 25 per cent in 2009. Manufacturing exports (around 70 per cent of total merchandise exports in 2009), declined from an all-time high of 80 per cent in 2002. There is a close association between the fluctuations in the growth fluctuations of the Malaysian economy and the manufacturing sector that underlines the importance of this sector. Finally, the manufacturing sector is targeted by the Malaysian government as the driver to become a high income economy (NEAC 2010a).

Figure 7 The manufacturing sector's performance



Source World Development Indicators, (2012).

Stochastic frontier production analysis, explained in Chapter 4, is again used to study the contribution of human capital to the performance of Malaysia's manufacturing sector. The stochastic frontier production analysis enables the study to measure the impact of local and foreign human capital on the productivity of the manufacturing sector. The study covers data from 187 industries from 2000 to 2005 and examines the effects of skilled, semi-skilled and unskilled human capital on the productivity growth of the manufacturing sector. The labour input is further decomposed into local and foreign human capital. The measurement of the technical efficiency in this model is based on is based on the neo-classical framework of profit maximisation, where firms' maximise profits with a given set of inputs and using the available best-practice technology.

The rest of the chapter is structured as follows. First, a survey of the outcomes and issues affecting human capital development in Malaysia is presented and is compared to selected similar economies. Second, a brief overview of the ways that human capital is measured is provided and the literature examining the links between human capital development and economic output is reviewed. The stochastic production function model is implemented and the results are presented. Finally, based on the empirical results, the role of educational and training institutions in the development of human capital for transition to a higher value-added economy is discussed briefly.

HUMAN CAPITAL DEVELOPMENT OUTCOMES IN MALAYSIA

A common measure of human capital development is school enrolment rates. Table 19 sets out enrolment rates in Malaysia. Malaysia has high schooling enrolment rates from primary to upper secondary school level. This reflects three important policy measures: schooling is compulsory in Malaysia; public schooling is provided at a nominal cost by the government; and students have automatic promotion until upper secondary level. These three policies do not apply to the pre-university and tertiary level. This may partly explain the drastic drop in enrolment at the pre-university and tertiary level.

Table 19 Participation rates by educational level, Malaysia, 1970-2010 (per cent) [a]

Educational level and age	1970 b	1980	1990	2000	2010
Primary (6 -11)	88.2	93.6	99.8	96.8	94.2
Lower secondary (12-14)	52.2	81.9	83.0	85.0	86.8
Upper secondary (15-16)	20.1	40.8	49.1	72.6	77.2
Pre-university (17-18) c	3.1	9.7	18.9	16.2	15.0
Tertiary (19 – 24)	0.6	1.8	2.9	8.1	16.0* (20**)

Note a – Refers to participation rates in public and government-aided institutions only (Enrolment/Population*100); b – Data refer to Peninsular Malaysia only; c – referred to as 'Post-secondary' in the source tables; * - author's calculation of domestic students in public universities; ** author's calculation of Malaysians from ages 20-24 enrolled for basic degree in domestic public and private universities and all Malaysian students enrolled overseas in 2010;

Source Hill et al. (2012) for data from 1970 to 2000; Ministry of Education, (2011) and Ministry of Higher Education, Malaysia, (2010) for all other data.

Table 20 sets out the educational attainment of the Malaysian labour force. It has shown considerable improvement, with the percentage of the labour force having no formal education being less than 5 per cent with more than half having secondary education.

Table 20 Educational attainment of the labour force by educational level, 1985 -2005 (per cent)

Educational level	1985	1995	2005	2010*
No formal education	14.1	8.6	4.6	9.0a
Primary	39.7	27.6	20.6	12.3
Secondary	41.5	52.7	55.7	51.3
Pre-university & tertiary	4.7	11.1	19.2	21.4

Note * For 1985 to 2005, the educational level is classified as in the table, but for 2010 the classification includes several additional classifications; a – no certificate

Source Hill et al. (2012); Department of Statistics, (2012).

Despite the commendable outcomes described above, human capital constraints are now recognised as a critical bottleneck in the Malaysian economy. There are several important studies and reports that provide evidence of this. Firstly, two comprehensive

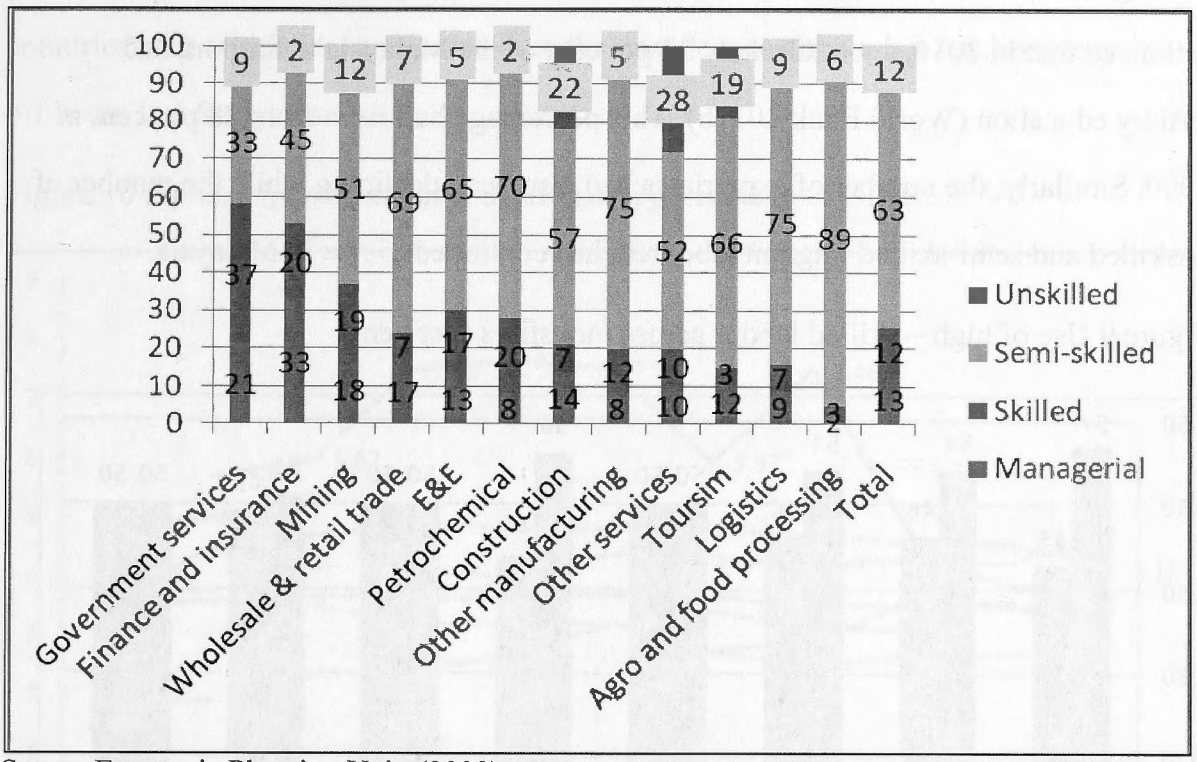
surveys (World Bank 2005; World Bank 2009b)[36] on the Malaysian economy, the Malaysian Firm Competitiveness, Investment Climate and Growth report (PICS-I)[37] and the Malaysia Productivity and Investment Climate Assessment Update (PICS-II)[38] provide evidence of this. Both these extensive surveys identify skills shortage as the main constraint to doing business in Malaysia.

In both the PICS-I and PICS-II survey, about 40 per cent of the firms stated that skills shortage is a critical problem that they face. The skills shortage identified relates to deficiencies in the area of English language skills, ICT skills and professional and technical skills. This outcome was similar to the first survey undertaken in 2002 suggesting that the situation had not improved (World Bank 2005; 2009b).

PICS-I also noted that 70 per cent of the managers surveyed identified the insufficient supply of university graduates as the main cause of skilled labour shortage. Furthermore, PICS-I report noted that 14 per cent of workers did not have the relevant educational background for their work. The situation appears to be deteriorating with PICS-II reporting that 25 per cent of workers with high school certificate felt they needed a university education to do their jobs properly. Only 10-15 per cent of workers believed their chosen field of education suited their current job and more than 15 per cent believed their educational qualifications were irrelevant to their occupation. The findings also reported that university graduates not choosing the fields of study that were of relevance to the growing high-technology industries and the manufacturing sector is also experiencing low incidence of training among firms, notwithstanding the fact that Malaysia possesses a good skills-development infrastructure.

[36] See Appendix 2 for a description of the surveys.
[37] Malaysian Firms Competitiveness, Investment Climate and Growth report - PICS-I.
[38] Malaysian Productivity and Investment Climate Survey - PICS-II.

Figure 8 Distribution of jobs by skills level across key sectors, 2007 (per cent)



Source Economic Planning Unit, (2009).

These findings are not surprising as, another important report, the National Economic Advisory Council's (NEAC) report[39] highlighted that in 2007, 80 per cent of Malaysia's labour force received education only up to Sijil Pelajaran Malaysia (SPM)[40] (NEAC 2010a). The Economic Planning Unit (EPU) of Malaysia reported that in 2007, 25 per cent of workers in Malaysia were classified as skilled or managerial while 63 per cent were semi-skilled and 12 per cent unskilled, suggesting that almost three-fourths of Malaysia's labour force was only moderately skilled as illustrated in Figure 8.

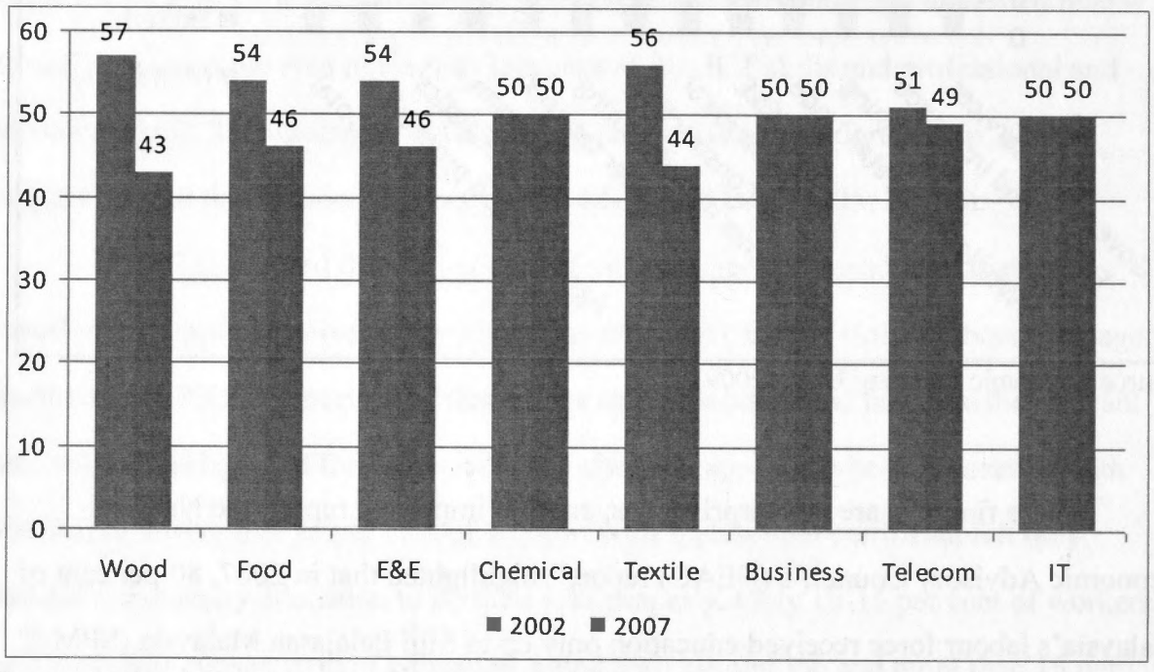
The NEAC report also highlights not only that was Malaysia facing skills shortages but also that there was an actual reduction in the percentage of skilled labour in several industries, between 2002 and 2007 as illustrated in Figure 9. A possible cause could be the reduction in net FDI and 'brain drain'. The effects of the 'brain drain' are mostly experienced when skilled Malaysians leave the country or are not returning after completing studies abroad. In addition, the strict regulations and controls on importing foreign skilled labour are also believed to have further exacerbated the country's skills-

[39] New Economic Model (NEM) Part 1.

[40] The Sijil Pelajaran Malaysia (SPM or MCE/Malaysian Certificate of Education) is equivalent to the British O – Levels or Australia's Year 10.

shortage problem (World Bank 2011b; NEAC 2010a; Thangavelu and Hu 2006). It is estimated that in 2010, approximately 33 per cent of the Malaysia's diaspora had tertiary education (World Bank 2011b). This percentage had risen from 28 per cent in 2000. Similarly, the number of expatriates had also been declining while the number of unskilled and semi-skilled migrant labourers has continued to rise in Malaysia.

Figure 9 Use of high – skilled labour across industries (per cent)



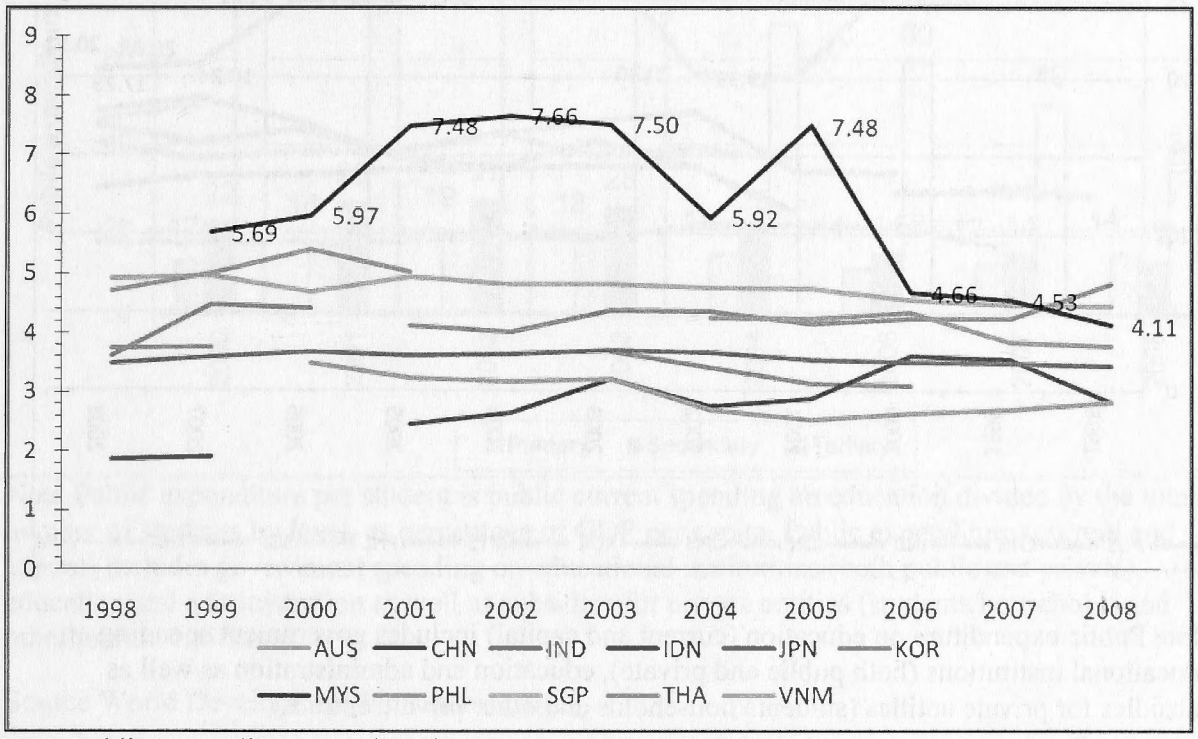
Source National Economic Advisory Council, (2010).

MALAYSIA IN COMPARISON TO ITS REGIONAL COMPETITORS

Malaysia's skills base can be compared with that of similar countries. A focus on East Asia is appropriate because Malaysia is highly integrated into the global production networks in the region. The upper bound is the technologically advanced economies in the region while the labour surplus economies in the region provide the lower bound. The comparators include the world's new economic giants, China and India, Malaysia's important regional competitors, Indonesia, The Philippines, Thailand, and Vietnam, and high income economies, Australia, Japan, Korea, Taiwan and Singapore. Australia and India although not part of the East Asian global production network, are included because of their increasing strategic importance to the East Asian region.

Malaysia's public spending as a percentage of GDP is highest among the countries with which it is compared over the past decade although it has been tapering off in the last few years.

Figure 10 Public expenditure on education as a percentage of GDP

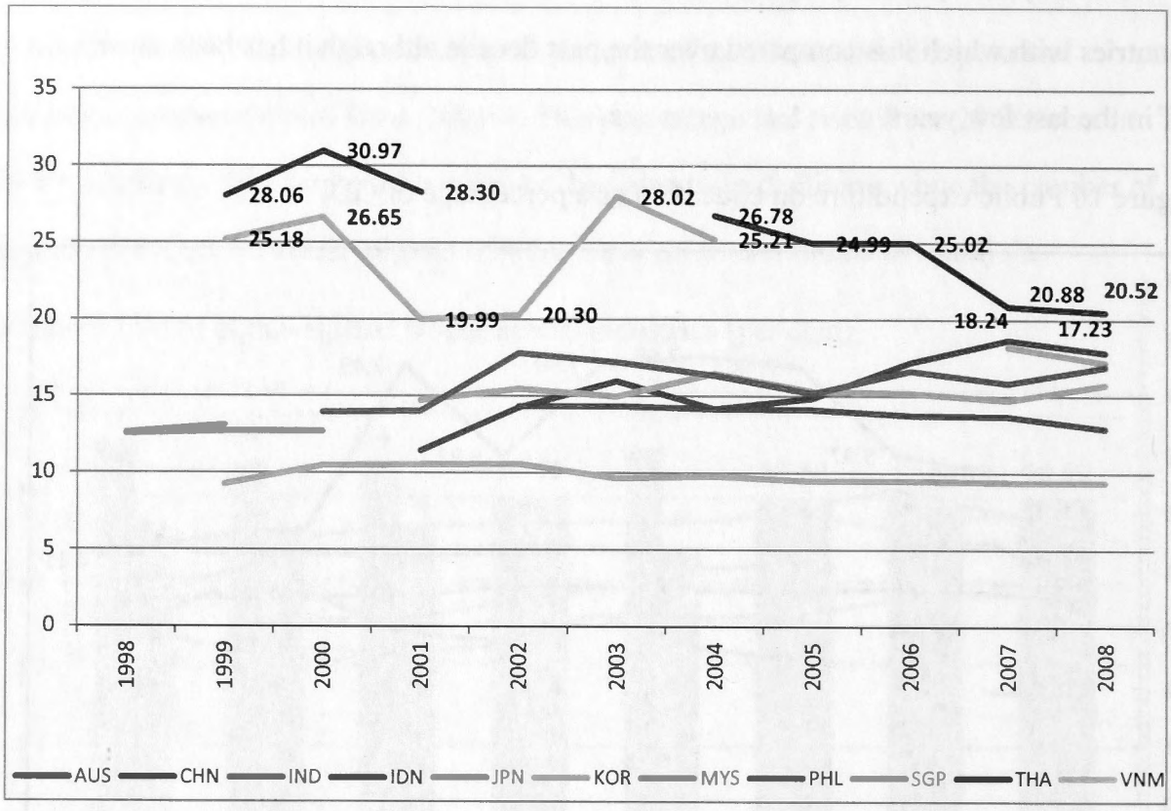


Note Public expenditure on education (current and capital) includes government spending on educational institutions (both public and private), education and administration as well as subsidies for private entities (students/households and other private entities).

Source World Development Indicators, (2012).

Malaysia's public spending in education as a percentage of government expenditure was second highest among those countries for which data are available. These data can be taken as an indicator of the Government of Malaysia's commitment to investment in human capital development.

Figure 11 Public spending on education as percentage of government expenditure

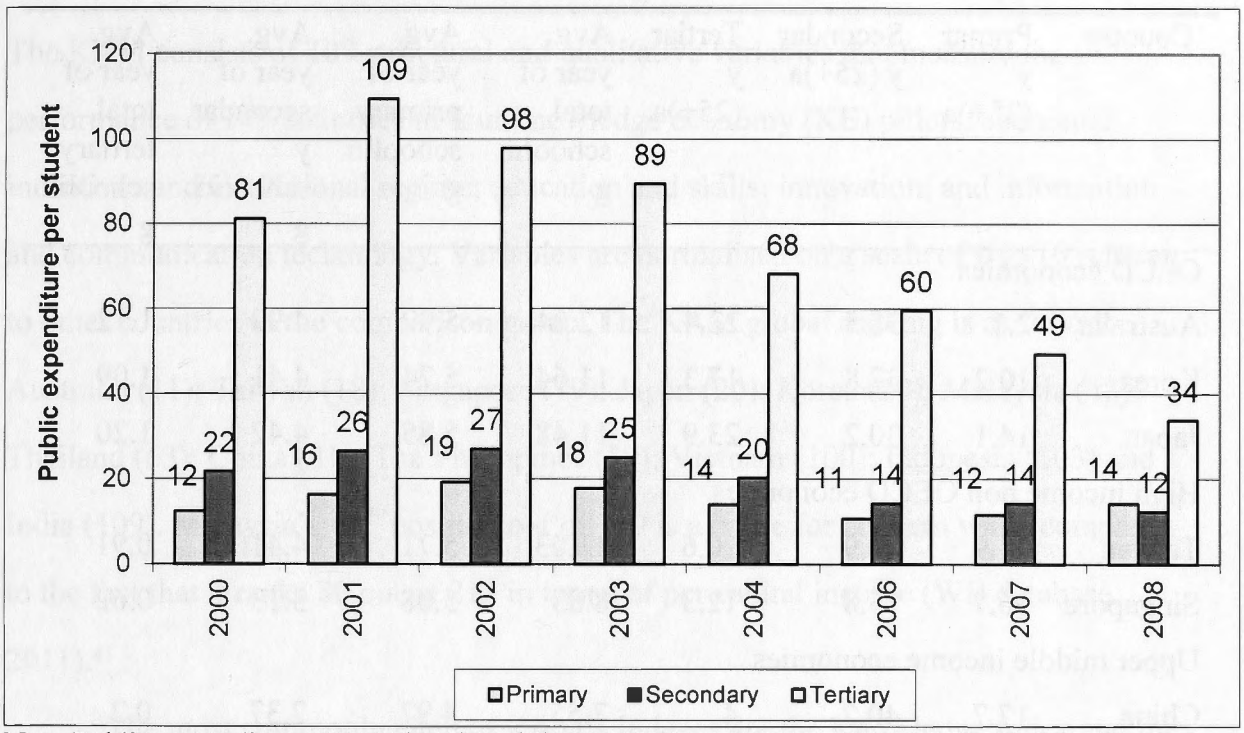


Note Public expenditure on education (current and capital) includes government spending on educational institutions (both public and private), education and administration as well as subsidies for private entities (students/households and other private entities).

Source World Development Indicators, (2012).

Investment in education however is not equally distributed at the different educational levels. There has been a bias towards investment in tertiary education compared to primary and secondary education although the gap appears to be tapering off as illustrated in Figure 12.

Figure 12 Investment per student as a percentage of GDP per capita



Note Public expenditure per student is public current spending on education divided by the total number of students by level, as percentage of GDP per capita. Public expenditure (current and capital) includes government spending on educational institutions (both public and private), education and administration as well as subsidies for private entities (students/households and other private entities).

Source World Development Indicators, (2012).

Despite significant investment in human capital development, the educational outcome for Malaysia appears less than satisfactory by international standards. The percentage of Malaysians over 25 years old who had completed tertiary education was below that of all high income economies and also that of the Philippines and Thailand as reported in Table 21.

Table 21 Educational attainment

Country	Primary (25+)a	Secondary (25+)a	Tertiary (25+)a	Avg. year of total schooling	Avg. year of primary schooling	Avg. year of secondary schooling	Avg. year of total tertiary schooling
OECD economies							
Australia	2.1	38.5	22.4	12.04	5.92	4.99	1.12
Korea	10.2	37.8	17.3	11.64	5.74	4.41	1.09
Japan	14.1	30.2	23.9	11.48	5.85	4.42	1.20
High income non OECD economies							
Taiwan	11.9	30.9	10.6	11.03	5.71	4.41	0.91
Singapore	16.7	15.8	12.3	8.83	5.08	3.13	0.62
Upper middle income economies							
China	17.7	40.2	4	7.55	4.97	2.37	0.2
Malaysia	12.9	33.8	5	9.53	5.16	3.99	0.38
Thailand	27.3	10	8.9	6.57	4.86	1.34	0.36
Middle income economies							
India	16.6	1	3.7	4.41	2.83	1.39	0.19
Indonesia	32	22.1	1.6	5.82	4.17	1.56	0.083
Philippine	18	19.8	22.4	8.67	5.34	2.28	1.04
Vietnam	38.8	11.6	2.9	5.49	3.98	1.38	0.15

Note The Barro-Lee dataset (2011) provides estimates for educational attainment data for 146 countries in five year intervals. It is the most commonly used dataset to measure educational attainment. a – percentage of population aged 25 years old and over that have completed various levels of education (primary, secondary and tertiary); Average year of schooling of population aged 25 years and over for different levels (total, primary, secondary and tertiary) .

Source Barro-Lee, (2010).

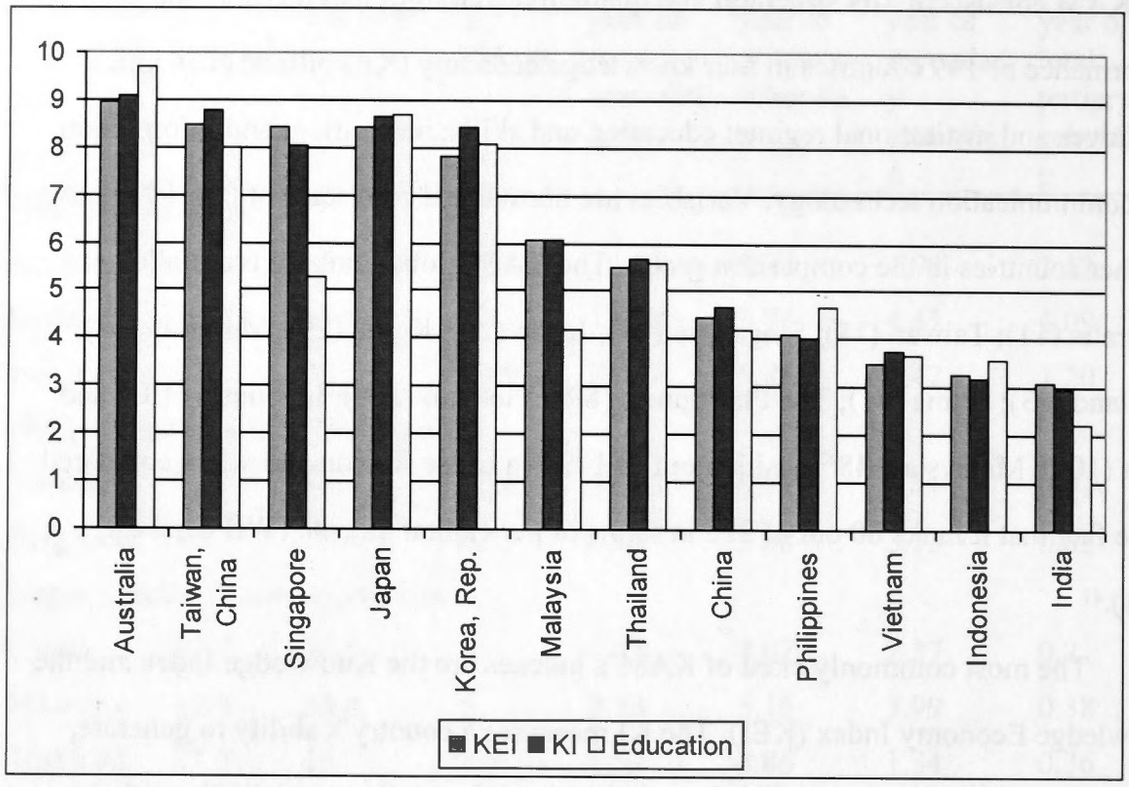
A key source of growth is the application of knowledge as manifested in entrepreneurship, innovation and research and development. A strong human capital base is one of several factors that are a pre-requisite for the application of knowledge. Indicators that measure the knowledge capability of economy provide an idea of the capability of the human capital base of an economy. Two commonly used indexes are selected to discuss Malaysia's performance in this area.

The first is the World Bank's Knowledge Assessment Methodology (KAM). The KAM consists of 109 structural and qualitative variables that measure the performance of 149 countries in four knowledge economy (KE) pillars: economic incentives and institutional regime; education and skills; innovation; and information and communication technology. Variables are normalised on a scale of 0 to 10 relative to other countries in the comparison group. The KAM global ranking is as follows: Australia (11); Taiwan (18); Singapore (19); Japan (20); Korea (29); Malaysia (48); Thailand (63); China (81); The Philippines (89); Vietnam (100); Indonesia (103) and India (109). Malaysia's 48th position out of 149 is a cause for concern when compared to the fact that it ranks 80 out of 215 in terms of per capital income (WB database, 2011).[41]

The most commonly cited of KAM's indexes are the Knowledge Index and the Knowledge Economy Index (KEI). The KI measures a country's ability to generate, adopt and diffuse knowledge. This is an indication of overall potential of knowledge development in a given country. The KEI takes into account whether the environment is conducive for knowledge to be used effectively for economic development. There are four key components as noted earlier. Malaysia performs slightly better than average (> 5) in both KI and KEI but performs below average in the education component (< 5).

[41] The World Bank's Knowledge Index and Knowledge Economy Index.

Figure 13 Knowledge index (KI) and knowledge economy index (KEI)



Source Computed from the World Bank Knowledge Assessment Methodology database

The Technology Achievement Index (TAI) is a composite index which aggregates national technological capabilities and performance in terms of: creation/diffusion of new technologies, (ii) creation/diffusion of old technologies, and (iii) development of human skills. The third component, the development of human skills, along with high technology exports[42] which is a sub-component of the diffusion of new technologies are the areas of our interest.

Mean years of schooling can be used as an indicator for the basic level of human skills. The idea behind the use of gross enrolment ratio (GER) is that a higher GER (primary, secondary and tertiary) ratio in a country over a period of time would ultimately result in a higher mean years of schooling. The sub-indicator which assesses human skills necessary to adapt to new technologies is the enrolment in tertiary

[42] High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

education in the field of science, mathematics and engineering as a percentage of the population at the tertiary level. This research also looks at the high technology export share of manufacturing goods to provide an indicator of the ability of human capital to absorb the diffusion of new technology.

Table 22 The Technology Achievement Index (TAI)

Country	Overall ranking	TAI a (2009)	High technology exports (% of manufactured exports) (2005-2006)	Gross enrolment ratio. All levels combined (2005-2007)	Gross enrolment ratio in science, engineering, manufacturing and construction (tertiary) (2005-2007)
OECD economies					
Australia	14	0.536	13	113	16
Korea	1	0.765	32	97	35
Japan	5	0.630	22	86	11
High income non OECD					
Taiwan	n/a	n/a	n/a	n/a	n/a
Singapore	4	0.642	57	87	24.2
Upper middle income economies					
China	54	0.334	31	69	3.2
Malaysia	23	0.490	55	71	11
Thailand	n/a	n/a	n/a	n/a	n/a
Middle income economies					
India	81	0.215	5	61	2.235
Indonesia	n/a	n/a	n/a	n/a	n/a
Philippines	37	0.411	71	81	8
Vietnam	n/a	n/a	n/a	n/a	n/a

Source Nasir et al. (2011)

In a sample of 91 countries, Malaysia was ranked 23 overall with Australia, Japan, Korea and Singapore ranked higher (Taiwan was not included in the sample). Malaysia's GER for all levels and the GER in science, engineering, manufacturing and construction at the tertiary level provide a stark reminder of the lag between Malaysia and the successful East Asian economies that have graduated into high income economies. It is also of interests that in certain indicators, Malaysia performs even more poorly than other lower and middle income countries. It can be concluded that

Malaysia's performance in the various indicators within the context of graduating from the middle-income level, is a cause for concern.

THEORY AND EMPIRICS OF HUMAN CAPITAL

Human capital can be broadly defined as the 'ability and efficiency of people to transform raw materials and capital into good and services' (Son 2010) or 'the knowledge, skills, competencies and attributes embodied in individuals, which facilitate personal, social and economic well-being' (OECD 2001).

As discussed in Chapter 2, the literature of modern growth theory emphasises the importance of the accumulation of factors of production especially human capital and technology in contributing towards economic growth. There are two main perspectives in human capital theory – one macroeconomic and the other microeconomic. From a macroeconomic perspective, the accumulation of human capital improves labour productivity, facilitates technological innovations and increases returns to capital. This in turn contributes to long term growth. Thus human capital is seen at the macro level to be one of the critical factors of production in any economy. From a microeconomic perspective, the accumulation of human capital increases the probability of being employed and improves an individual's lifetime earning capacity. Hence, at the micro level, human capital is considered to be the component of education that contributes to an individual's labour productivity and earnings. Micro level analysis also incorporates the impact of human capital on firm performance.

It is important to note that the literature relating to human capital theory distinguishes among several types and means of education. There is formalised education at primary, secondary and higher levels (Cohn and Geske 1990), informal education at home and at work (Schultz 1981), on-the-job training and apprenticeship (Mincer 1974) in the workforce and specialised vocational education at secondary and higher levels (Corazzini 1967).

Human capital first came to prominence in the Solow model (1956), the first generation of neo-classical growth models. Although not explicitly, the central role of technology in the Solow model provided the impetus for the focus on human capital via education. Nelson and Phelps (1966) made the link explicit. They argued that 'investments in humans' through education were necessary for workers to utilise new technologies that were exogenously developed, thereby increasing total factor productivity and spurring economic growth.

In endogenous growth theory, the central role of human capital was made even more explicit as it was central in technological development which spurred economic growth. The works of Lucas (1988), Romer (1990), Mankiw, Romer and Weil (1992), Barro and Sala-i-Martin, (1997) demonstrated that the accumulation of human capital through education and on-the-job training fosters economic growth by improving labour productivity, promoting technological innovation and adaptation.

Numerous cross-country empirical studies have established a positive correlation between human capital and economic growth. Azariadis and Drazen (1990) find that a country's literacy rate in 1960 is a significant determinant of per capita GDP growth for 1960 – 1980, and literacy rates and initial per capita GDP in 1960 together account for 38 per cent of the variation in the economic performance in the 20 year period. Using school enrolment as the measure of human capital, Barro (1991) finds that primary and secondary school enrolment rates are positively linked with economic growth and investments while being negatively linked with fertility rates. Mankiw, Romer and Weil (1992) find that the elasticity of per capita GDP to enrolment rate is 0.66 for non-oil exporting countries and 0.76 in OECD countries.

Applying the Mincerian specification, Barro and Lee (2010) estimate that increasing average years of schooling by one year increases per capita GDP by 1.7 to 12.1 per cent depending on how the model is specified. Cohen and Soto (2007) calculate returns to years of schooling at 12.3 to 22.1 per cent. By testing the impact of school quality on growth, Hanushek and Woessmann (2009) find that a unit increase in a

country's cognitive test scores increases its per capita GDP growth rate by 1.2 – 2.0 percentage points. Furthermore, increasing average mathematics and sciences scores by one unit increases per capita GDP growth rates by 2.0 points, and by 2.3 points for low-income countries. Overall, these studies find that education is significantly and positively correlated with economic growth and argue that causation runs from education to growth in line with human capital growth models.

The literature on human capital and economic growth however suggests that the above finding is far from inconclusive. Firstly, there are some who suggest that the causation runs in the reverse, that is, economic growth increases returns to education and thus causes people to attain more education (Bills and Klenow 2000; Krueger and Lindahl 2001). Secondly, there is a lack of consistency between human capital theory and empirical testing. While Solow (1956) and Nelson-Phelps (1966) defined the basis of human capital, testing them has been a problem. Mincer (1974) tested the relationship between human capital and growth by measuring human capital as years of schooling and growth as personal income, and derived a log-linear specification for output and schooling. Hanushek and Kimko (2000) argue that the cognitive ability, as measured by achievement test scores, is a more relevant measure of human capital, since cognitive ability directly relates to the ability of a worker to implement technology as required by the Nelson-Phelps model.

Another set of debates revolves around the trade-offs between general education against vocational education. Some countries focus on general education (for example, the United States) which focuses on broad knowledge and basic skills that serves as foundation for further learning and on the job-training. Others focus on vocational training (as in Germany and Denmark) which provides specific skills that improve the entry of workers into the economy. The skills generated by vocational education may facilitate the transition into labour market but may later become obsolete at a faster rate (Hanushek et al. 2011). Hanushek et al. (2011) find that people with general education initially face worse employment outcomes but experience improved employment

probability as they become older relative to individuals with vocational education. Meanwhile, in the US (and countries without well-known vocational education system), the employment probability of individuals with different types of education does not vary with age at all whereas in most European countries, the age-employment pattern differs and sometimes quite significantly between individuals with general and vocational education. This difference is most pronounced in the well-known apprenticeship countries of Denmark, Germany and Switzerland.

Another way to analyse the contribution of human capital to economic growth is through the growth accounting method, which assigns the contribution of various inputs such as labour, physical capital and factor productivity towards outputs. An advantage of this approach is that it avoids the ambiguities of measuring human capital and is internally consistent (Stevens and Weale 2004). To this extent, Bosworth and Collins (2003) proposed an interesting growth accounting method that is an exact decomposition quantifying the contribution of growth in factors of production (including human capital, physical capital and total factor productivity) to growth in labour factor productivity.

THE EMPIRICAL MODEL AND APPLICATION

Notwithstanding the growth accounting method, two broad classes of growth models in relation to human capital can be distinguished. The first emphasises capital accumulation as a source of growth. In particular, in this analysis the rate of growth depends on the rate of accumulation of human capital and not the stock of human capital. The works of Mankiw et al. (1992) and Lucas (1988) are in this class. The second class describes growth as being driven by the stock of human capital, which in turn affects a country's ability to innovate or to catch up with more advanced countries.

A novel approach in analysing the relationship between economic growth and human capital by appealing to the production literature that was first used in Chapter 4 is deployed once again in this context. Following the production literature,

manufacturing sector output, or manufacturing sector performance, is modelled using the stochastic frontier approach. Stochastic frontier analysis, as explained in Chapter 4, is used to measure the productive performance of a firm in relation to the productive performance of firms following the best-practice techniques of the technology, as the later firms are defined as fully technically efficient. Such analysis produces not only a qualitative rankings of all economic units but also numerical efficiency scores that can be further used to identify the determinants of why some firms are more technically efficient than others. Specifically, the analysis in this chapter examines how important human capital development (measured through the three different skills level and through citizenship) is towards contributing to the differences in technical efficiency across manufacturing firms in Malaysia.

Another important reason for adopting the stochastic frontier approach is because of its ability to differentiate between efficiency factors such as technology adoption and improvements on organisational structures and random events. Traditionally, cross-country empirics based on neo-classical economics, have assumed full technical efficiency across firms, which tends to bias the productivity measurement (Kalirajan and Shand 1999). This assumption that economic units are always efficient and producing on the production possibilities frontier (instead of within it), implies that actual output is the maximum attainable output and that all economic units are fully technically efficient. In reality, not all economic units may use the best-practice technique of the chosen technology due to various reasons such as lack of human capital development (Bos et al. 2010).

The impact of human capital on productivity is implemented in two stages. The technical efficiency measure is estimated from the stochastic production frontier. The sources of productivity growth including local and foreign human capital such as local skilled, local unskilled, foreign skilled and foreign unskilled labour on manufacturing productivity is analysed using the technical efficiency measured derived in the first stage.

The stochastic production frontier is applied in a Cobb Douglas framework from panel data. The stochastic production frontier in the Cobb Douglas framework is given as:

$$\text{Ln}(Y_{it}) = \beta_0 + \beta_1 \text{Ln}(K_{it}) + \beta_2 \text{Ln}(\text{Lab\_local}) + \beta_3 \text{Ln}(\text{Lab\_foreign}) + \beta_4 Ln(Estab) + v_{it} - u_{it} \quad (4)$$

where Y_{it} is gross output, K_{it} is fixed assets, Lab_local_{it} is local labour, $Lab\_foreign_{it}$ is the foreign labour, and $Estab_{it}$ is the number of establishments,[43] which a simple proxy to measure industrial concentration. All variables are given in natural logs. v_{it} is the random error term that is assumed to be identically and independently distributed (i.i.d) as $v_{it} \sim (0, \sigma_v^2)$. The v_{it} is also the stochastic element of the production function that captures random shocks to each firm.

The technical efficiency term is given as u_{it}. Both v_{it} and u_{it} are distributed independently of each other. The technical efficiency term, u_{it}, is estimated in two ways: as a time-invariant, which means that technical efficiency remains the same for a firm over the years and time-varying (decay), which means that technical efficiency, changes over the years, specifications. The time-invariant form is given as $u_{it} = u_i$, and $u_i \sim N^+(\mu, \sigma_u^2)$. The time-varying (decay) specification of u_{it} is given as:

$$u_{it} = \exp\{-\eta(t-T)\}u_i \quad (5)$$

where t is the current period and T is the last period in the i^{th} panel and η is the decay parameter. The decay parameter indicates the movement of the inefficiency over time where the degree of inefficiency declines over time towards the baseline when $\eta > 0$ and degree of inefficiency increases over time when $\eta < 0$.

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[43] The total number of establishment is used in the production function to analyse the impact of firms in the manufacturing sector on output while local and foreign establishments are used to see if ownership have different impact on productivity. There could be externalities and spill-overs that could be correlated with the local and foreign establishments and technical efficiency. However, there is no biasness in the estimation.

DATA AND RESULTS OF STOCHASTIC PRODUCTION FRONTIER

The data for the study were obtained from the Malaysian Manufacturing Survey, Department of Statistics. The data are obtained from 2000 to 2005 for 5 digit industrial classification[44] which consists of 187 industries. All data are based to 2000 prices.

The results are presented in Table 23. The results indicate that capital investment and local labour makes the most significant contribution to output growth in the manufacturing sector. In contrast, the contribution of foreign labour to manufacturing sector is very small and not statistically significant for the time-varying specification.

Table 23 Stochastic production for Malaysian manufacturing industry, 2000-2005

Variable	Time-Invariant		Time-Varying (Decay)	
Constant	5.045	(0.270)	4.666***	(4.820)
Ln(Kit)	0.567***	(20.440)	0.566***	(21.090)
Ln(Lab_local)	0.519***	(11.630)	0.553***	(12.770)
Ln(Lab_foreign)	0.041***	(2.170)	0.0002	(0.120)
Ln(Estab)	-0.140***	(4.720)	-0.123***	(-4.510)
μ	2.500	(0.130)	2.086***	(2.200)
$\gamma = \sigma 2u / \sigma 2S$	0.703***	(24.240)	0.703***	(21.980)
$\sigma 2S = \sigma 2u + \sigma 2v$	0.334***	(11.399)	0.303***	(10.820)
$\sigma 2u$	0.235***	(8.103)	0.213***	(7.613)
$\sigma 2v$	0.099***	(19.800)	0.090***	(18.000)
η	-		0.024***	(2.320)
Observations	761		761	
Log likelihood	--398.06		-369.01	

Note T-statistics in the parenthesis; *-10% level of statistical significant, **-5% level of statistical significant, *** - 1% level of statistical significant

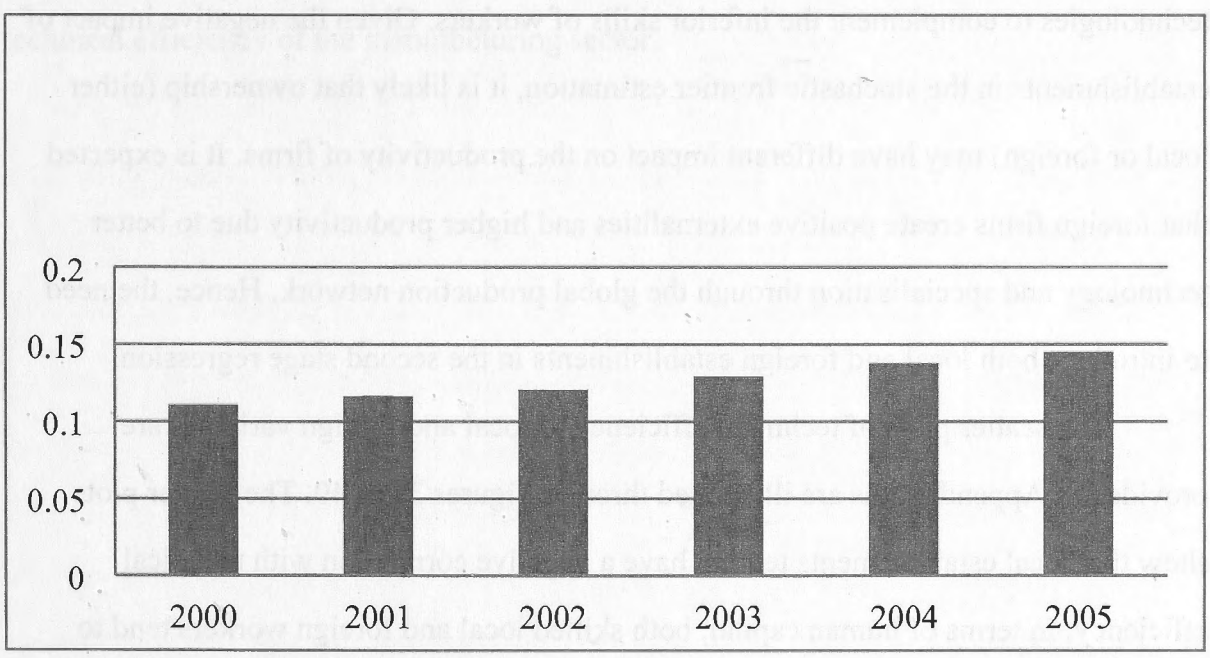
Ln(Estab) is negative and statistically significant. The negative coefficient suggests that the output tends to decrease with the increase in the industrial concentration. The negative coefficient could indicate there are little linkages and externalities from the increase in the manufacturing activities and competition.

The statistical significance of the parameter γ suggests that modelling the production behaviour of Malaysian manufacturing firms in a stochastic frontier framework rather than the conventional production function framework is appropriate

[44] The industrial classification follows the Malaysian Standard Industrial Classification 2000 (MSIC 2000)

for the present data set. This means that the production performance differences across firms occur mainly due to differences in technical efficiencies across Malaysian firms. Table 23 shows that the variances of error terms is σ^2_v is 0.099 and σ^2_u is 0.235 respectively. The variance of the one-sided error (technical efficiency), σ^2_u, is more than twice that of the variance of the random error and indicates that a greater part of the variation in the residual is due to technical efficiency rather than random error associated with the production function. It is also interesting to observe that η is positive and statistically significant indicating that technical efficiency improves over time. In could suggest that firms have been improving their technical efficiency by making significant efforts to follow the best-practice techniques of their chosen technologies as illustrated in Figure 14. It is interesting to examine whether human capital development has contributed to the improvement in technical efficiency over the years, which is attempted in the next section.

Figure 14 Improvement in technical efficiency in the Malaysian manufacturing sector based on Stochastic Production Frontier.



To understand the impact of local and foreign human capital on technical efficiency, the second stage analysis using the technical efficiency measure derived

from the Stochastic Frontier is implemented. The impact of human capital development on technical efficiency improvement of the manufacturing sector is explored by estimating the following equation in a panel framework:

$$TE = \alpha_0 + \alpha_1 Ln(local\_skilled) + \alpha_2 Ln(local\_semiskilled) + \alpha_3 Ln(local\_unskilled) + \alpha_4 Ln(foreign\_skilled) + \alpha_5 Ln(foreign\_semiskilled) + \alpha_6 Ln(foreign\_unskilled) + \alpha_7 Ln(local\_estab) + \alpha_1 Ln(foreign\_estab) + \varepsilon_{it} \quad (6)$$

Positive coefficients should be expected if human capital development complements and improves the technological capacity and productivity of the firms. Conversely, there is a possibility that negative coefficients might be observed due to skill mismatches if the workers do not have the relevant skills to meet the skills demands of the firms. In this case, firms might experience high search cost and also might be impaired from adopting new technologies and had to implement inferior technologies to complement the inferior skills of workers. Given the negative impact of establishments in the stochastic frontier estimation, it is likely that ownership (either local or foreign) may have different impact on the productivity of firms. It is expected that foreign firms create positive externalities and higher productivity due to better technology and specialisation through the global production network. Hence, the need to introduce both local and foreign establishments in the second stage regression.

The scatter plots of technical efficiency to local and foreign variables are provided in Appendix 2 as are illustrated through Figures 31 to 40. The scatter plots show that local establishments tend to have a negative correlation with technical efficiency. In terms of human capital, both skilled local and foreign workers tend to have a positive trend line with technical efficiency, thereby indicating human capital accumulation tends to increase the technical efficiency in the manufacturing industries. However, it was also noticed that local semi-skilled workers tend to have a negative

trend line with technical efficiency. This indicates that local semi-skilled workers do not contribute substantially to the productivity and technical efficiency within the manufacturing sector. The negative coefficient could be mainly driven by skills mismatch of the semi-skilled workers in meeting the demands of the firms.

The results of the second stage regression are set out in Table 24. The results indicate that local human capital in terms of skilled and semi-skilled workers do not contribute significantly to the technical efficiency in the manufacturing sector. In fact, local semi-skilled workers have a negative impact on the manufacturing technical efficiency. However, the results do indicate that local unskilled workers contribute positively to the technical efficiency in the manufacturing sector. This might reflect the low technology adoption in the manufacturing sector that complements low-skilled workers as compared to more skilled workers.

The contribution of foreign workers also makes for interesting analysis. Foreign skilled and semi-skilled workers are not associated with positive effects on technical efficiency. Rather, it was observed that foreign unskilled contributed positively to the technical efficiency of the manufacturing sector.

Table 24 Determinants of Technical Efficiency in the Manufacturing Industries in Malaysia, 2000-2005

Variables	Fixed Effects		Random Effects	
Ln(local_skilled)	0.006	0.009	0.009**	0.006
	(0.004)	(0.950)	(2.060)	(1.170)
Ln(local_semiskilled)	-0.018***	-0.015***	-0.021**	-0.017***
	(-5.460)	(3.390)	(-6.100)	(-3.540)
Ln(local_unskilled)	0.003*	0.004***	0.004**	0.006**
	(1.650)	(2.870)	(1.910)	(2.450)
Ln(foreign_skilled)	-0.008	-0.005	-0.001	-0.011
	(-0.640)	(-0.500)	(-0.910)	(-0.720)
Ln(foreign_semiskilled)	0.0025*	0.011	0.002	0.001
	(1.750)	(1.520)	(1.060)	(0.650)
Ln(foreign_unskilled)	0.002**	0.035*	0.001*	0.001*
	(2.010)	(1.600)	(1.770)	(1.650)
Ln(local_estab)	-	-0.080***	-	-0.044***
		(-4.340)		(-2.770)
Ln(foreign_estab)	-	0.001	-	0.001
		(0.160)		(0.004)
Constant	0.195***	0.501***	0.202***	0.287**
	(10.79)	(3.560)	(9.920)	(2.190)
R-Square	0.239	0.234	0.234	0.210
Observation	232	232	232	232

Note T-statistics in the parenthesis; *-10% level of statistical significant, **-5% level of statistical significant, *** - 1% level of statistical significant

Local establishments (Ln (local_estab)) tend to have a negative and statistically significant impact on technical efficiency within the Malaysian manufacturing sector. At this stage of the analysis, it is difficult to determine precisely the reasons. However, several hypotheses that are commonly cited such as low levels of technology uptake and lack of innovation in domestic firms as most of the local establishments are small and medium scale enterprises are plausible reasons for these outcomes (Yusuf and Nabeshima 2009; Rasiah 2002; 2009a; 2010; Menon 1998).

HUMAN CAPITAL AND THE MANUFACTURING SECTOR PERFORMANCE

Based on the results of this study and the literature on the links between human capital development and economic growth, there are several issues which emerge that are of relevance to the development of human capital as Malaysia aims to transit

towards high income economy. It appears very likely that there are skills mismatch in the Malaysian manufacturing sector. This is reflected mainly by the negative impact of semi-skilled workers to manufacturing sector output. The negative coefficient could be mainly driven by skilled mismatches of the semi-skilled workers in meeting the demands of the firms.

The results here raise several important issues coalescing around the first question posited in this thesis: what are the domestic institutional issues that are constraining Malaysia's economic growth and its ability to overcome the middle-income trap.

The first relates to the critical issue of aligning human capital development and the changing industrial structure of the Malaysian economy. The East Asian economies of Korea, Taiwan and Singapore invested heavily in higher education and aligned their educational policy to changing demand conditions in the economy. Why has Malaysia, despite significant investment in human capital development, failed to produce comparable results?

Secondly, recognising that the Malaysian economy is an open economy driven importantly by foreign direct investment and export growth, are Malaysia's educational and training institutions geared towards accommodating changing demand conditions in terms of the needs of multinational corporations and large corporations that dominate Malaysia's manufacturing sector?

The literature highlights that the probability that the demand for science and technical skills will increase as the Malaysian economy transitions towards an innovation-based economy. Therefore there is an imperative in investment in science and technology (S&T) at the tertiary level and concurrently a need for the intake for S&T to be increased. This additionally suggests a need for investment in laboratories and research centres at universities that will provide the link between academic institutions and industries in transferring technologies and knowledge to industry. This is an important conduit for aligning the educational system to the changing needs of the

industries. Increases in intake would need to be complemented with strong academic staff in S&T. Malaysia appears to have undertaken all of the above beginning since the early 1980s (Rasiah 2002). Why then is Malaysia still failing in producing the needed human capital?

The literature also highlights the importance of training and re-tooling (or re-training) workers to sustain their human capital in rapidly changing industrial structure. Malaysia has a good number of industrial training centres and polytechnics yet once again Malaysia fails in producing the required number of skilled- and semi-skilled workforce. Why?

The literature further highlights the importance of proper certification of the various training programmes at the national level as vital for the recognition of the training and suggests that a national agency be set to up to accredit the various training institutes and maintain the quality of skills training. Malaysia has all of these in place but appears still unable to produce the required human capital. Why?

The recognition of changing demand for skilled workers needs to be aligned with the need for an English-speaking work force with high educational attainment employed in rapidly changing S&T production activities. For example, the significant increase in information and telecommunication technologies requires workers with good communication and software skills to support activities ranging from business services to sophisticated financial services. Malaysia, a former British colony and whose education system has English incorporated as a subject from primary school, has seen its English language proficiency of its citizens regress. Why?

Immigration policy is another important component able to create flexibility in the labour market and the skilled foreign workers could be used to augment domestic human capital. However, in the Malaysian case, the converse appears to be the case. The regression results indicate that skilled and semi-skilled foreign workers do not contribute positively to technical efficiency of the manufacturing sector and purely act as factor inputs. The converse is true with unskilled foreign labour, which does

contribute positively to technical efficiency. This raises two possible policy considerations: (i) that skilled foreign workers have not been sufficiently or effectively utilised in the manufacturing sector; and (ii) the current policy of promoting unskilled foreign labour, while beneficial in the short run, can stifle human capital upgrading.

CONCLUSION

This chapter analysed the contribution of labour at the different skill levels to the manufacturing sector's performance in two stages. In the first stage, the stochastic frontier framework was utilised to analyse the contribution of local and foreign labour (categorised into three skill levels), towards the manufacturing sectors performance in terms of output and productivity, in addition to other conventional factors such as capital and the number of establishments in the manufacturing sector. The results indicate that capital investment and local labour contributes most significantly to output growth in the manufacturing sector. Conversely, the contribution of foreign labour was insignificant.

The chapter also estimated the contribution of the various types of human capital (local and foreign; skilled, semi-skilled and unskilled) to the technical efficiency of manufacturing industries in Malaysia through the second stage analysis using technical efficiency measure derived from the stochastic frontier model that was utilised in the first stage. The results suggest that local skilled and semi-skilled human capital has little impact on the technical efficiency of the manufacturing sector. In fact, the contribution of semi-skilled workers has a negative and statistically significant impact on the technical efficiency of the manufacturing sector. In contrast, it was observed that it was the statistically significant impact of unskilled labour that improved the technical efficiency of the manufacturing industries. Given the complementarity of low value-added technology to unskilled labour, it is very likely that the Malaysian manufacturing sector is experiencing low technology innovation and adopting low value-added technology.

The second stage results also indicate that local establishments have a negative impact to the efficiency in the manufacturing sector. This supports existing arguments that manufacturing firms in Malaysia, which comprise predominantly of small and medium scale enterprises, are highly inefficient.

The above results also confirm existing studies which suggests that educational development and institutions that enhance human capital and technological capacity and capability will be crucial to increasing the competitiveness of Malaysia's manufacturing sector in order to overcome the middle income trap.

The chapter also raised several important questions about how these results might be explained more comprehensively. The proximate reason appears to be low technology innovation and not following the best-practice techniques of the chosen technology by the manufacturing sector. If this is due to the fact that most of the local manufacturing firms are small and medium scale enterprise, then the question must be asked, as to why they have remained so despite various public pronouncements by the government of Malaysia to further develop small and medium scale enterprises, and to move them up the value chain.

Chapter 7 explores and addresses these questions more comprehensively.

Chapter 6 Human capital development and income inequality in the manufacturing sector

> Inequality however remains a real challenge for Malaysia. While overall income disparity improved…the disparity seems to have increased over the past decade for certain groups. The disparities among the urban groups remain high… Moreover, the results of household income surveys over the years suggest that income growth has been strong only for the top 20 per cent of Malaysian income earners…The bottom 40 per cent of households have experienced the slowest growth of average income.
>
> NEAC (2010a, p. 57-58)

High income inequality has always been a major concern of Malaysian policymakers as it is judged to have a destabilising effect on the country. In response, the Malaysian government has introduced some of the most extensive measures in the world to address inequality especially in favour of the majority Bumiputera community who were identified as lagging behind in socio-economic indicators. This concern has been further aggravated as growth beyond the middle income threatens to accentuate income inequality in Malaysia further if left to its own devices. This chapter investigates issues relating to income inequality in Malaysia and by examining three common determinants of wage inequality in order to understand this phenomenon better: technology and trade and the impact of migrant workers in the manufacturing sector

THE MIDDLE-INCOME TRAP AND INEQUALITY

Inclusive growth has been a key objective of policymaking in Malaysia since independence. Malaysia has achieved high rates of growth over the last four decades although the growth has been at slower rates in the recent past decade. Growth rates, although highly volatile, were achieved through sound macroeconomic policies, investment in infrastructure, human capital and other complementary measures. Concomitantly, income per capita and household consumption have all risen steadily

over the first four decades of independence although their growth has decelerated in the past decade.

Government policies have also been successful in reducing disparities between urban and rural areas and among ethnic groups (Mat Zin 2011; World Bank 1993). Key to this has been the New Economic Policy (NEP) introduced in 1971 which sought to eradicate poverty and to restructure society to eliminate the identification of ethnicity from economic function. The underlying principles of the NEP were carried through into successive long term plans such as the National Development Policy (NDP); the National Vision Policy (NVP); the National Mission; and now in the Government Transformation Programme, Economic Transformation Programme and Strategic Reform Initiatives.

These successful national strategies which had a strong emphasis on industrialisation and wealth redistribution, have seen the Malaysian economy not only achieve these social and political objectives, but also shift away from reliance solely on agricultural commodities and minerals to having a broader industrial and manufacturing base since the early 1970s.

The value-added contribution of the industrial sector [45] had surpassed agriculture as early as 1970 but more importantly, the value added of the manufacturing sector to GDP –Malaysia's vehicle for industrialisation – surpassed the contribution of agriculture in 1987.

Malaysia first experimented with import oriented industrialisation. The strategy however proved to be a failure and it has been argued contributed to the May 13, 1969 race riots. Since the early 1970s, Malaysia embarked on an export-oriented industrialisation (EOI) strategy. The EOI strategy saw Malaysia's nominal trade to GDP ratio rise to almost 2:1, making Malaysia one of the more open economies in the world especially in the manufacturing sector. Since the mid-1990s, the Malaysian government

[45] The industrial sector broadly defined includes manufacturing, mining and energy.

has begun pursuing a strategy that seeks to move towards a knowledge-based economy with emphasis in the services sector.

The signs are clear however that Malaysia's growth is decelerating and that it has hit the middle-income trap as noted in Chapter 1. The transition towards a high income country brings with it a different set of challenges due to the nature of economic growth beyond middle income levels, significantly different challenges from those associated with growth from low income to middle income. Growth beyond middle income tends to be more capital and skills intensive as the economy moves towards specialised industries. This leads to increased demand for skilled workers, and wage rises for skilled workers relative to semi-skilled or unskilled workers.

Hence, the argument runs, to revive growth Malaysia will need to boost innovation capabilities and increase the knowledge intensity of economic activity. This is likely to accentuate disparities across skill levels. Spatial disparities may also widen as geographical clustering leads to greater concentration of high value-adding economic activity, which is likely to favour urban areas. The restructuring of the sources of growth, along with the need to expose the economy to greater competition entails additional risk that some groups will be left behind. The government is therefore rethinking its strategies to reduce poverty and address income inequality between and among the races in the context of returning to higher and sustainable growth rates.

Several studies have highlighted the widening wage gap between skilled and unskilled workers in developed countries, due to the rising demand for skilled workers as the new technologies used in modern workplaces have altered employers' demand for skills (Machin 2001; Autor et al. 1998; Acemoglu and Autor 2010). The key aspect is that there has been an up-skilling of the labour force as the demand for workers shifted to requiring higher educational qualifications and skill levels. This has led to a dramatic fall in the demand for unskilled workers and thus the widening wage gap in the labour market. The widening wage gap is expected to have drastic social and economic impact on developed countries in terms of unemployment and widening income inequality.

This chapter reviews and analyses features of income inequality in Malaysia, looking at whether indeed there is a widening wage gap between skilled and unskilled workers in the manufacturing sector in Malaysia and what are its causes. The focus is on the impact of migrant workers, trade and technology on wage divergence. The results will enable evaluation of the institutional arrangements that underpin Malaysia's efforts at addressing income inequality more broadly.

INCOME INEQUALITY IN MALAYSIA

Over the years, Malaysia has performed remarkably well in addressing absolute poverty. The incidence of absolute poverty has been reduced from approximately 52 per cent in 1970 to 4 per cent in 2009. However this stellar performance at the national level masks differing achievements in poverty reduction at the regional level and also high levels of income inequality.

Table 25 illustrates that there are high levels[46] of income inequality, represented by the Gini index, present in all regions of Malaysia. Income inequality and poverty is highest in the states of Sabah and Sarawak which are on the island of Borneo and geographically separated from Peninsular Malaysia by the South China Sea. There has been negligible improvement in income inequality over the past 40 years.

[46] The Gini Index which is a measure of income inequality is considered high if it is above 0.4

Table 25 Broad trends in incidence of poverty and income inequality

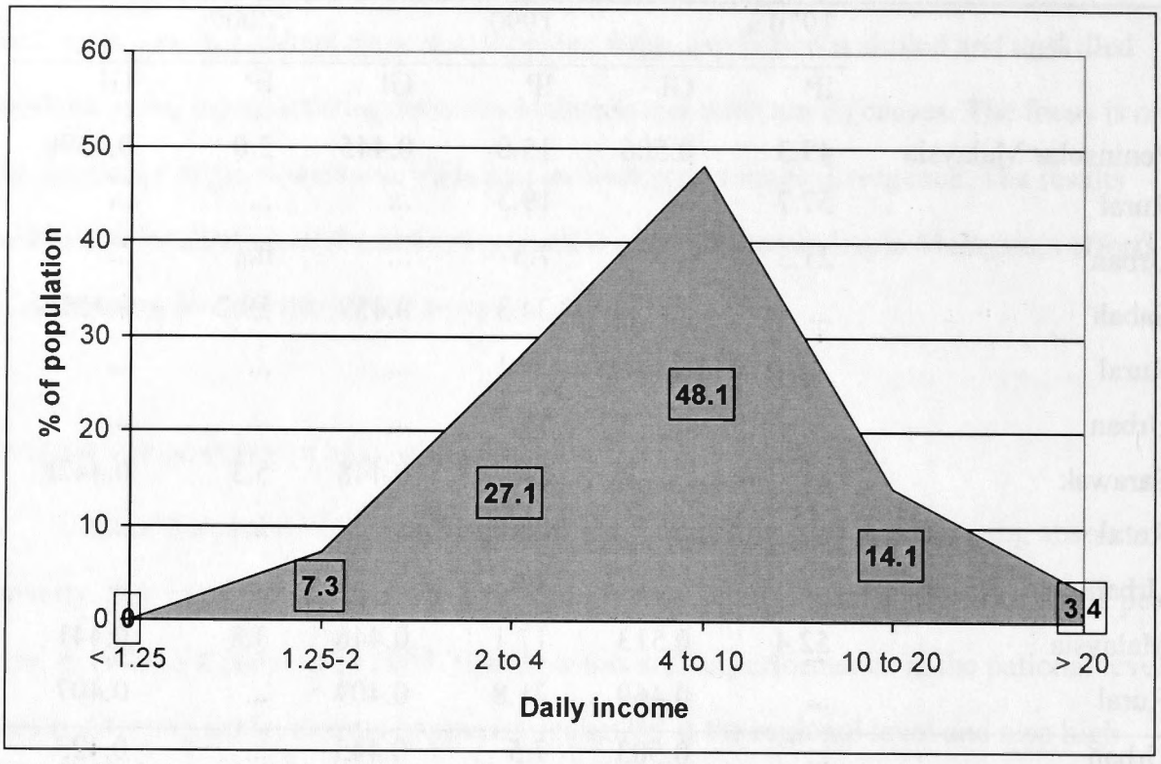
	1970 a		1990		2009	
	IP	GI	IP	GI	IP	GI
Peninsular Malaysia	49.3	0.506	15.0	0.445	2.0	0.439b
Rural	57.7	...	19.3	...	...	...
Urban	21.3	...	7.3	...	n.a	...
Sabah	...	...	34.3	0.459	19.2	0.451b
Rural	...	...	39.1	...	...	...
Urban	...	...	14.7	...	...	...
Sarawak	...	...	21	0.448	5.3	0.442b
Rural	...	...	24.7	...	...	...
Urban	...	...	4.9	...	...	...
Malaysia	52.4	0.513	17.1	0.446	3.8	0.441
Rural	...	0.469	21.8	0.409	...	0.407
Urban	...	0.503	7.5	0.445	...	0.423

Note IP – incidence of poverty in percentage terms; GI – Gini coefficient is an index; Poverty incidence for 1970 – 2002 were based on the 1977 methodology while the incidence of poverty for 2004 – 2009 is based on the 2005 methodology; a – Figures refer to Peninsular Malaysia only; b is GI for 2007; ... – data not available

Source Hill et al. (2012).

Figure 15 provides information on the distribution of population by income group based on data from household surveys of consumption expenditure. It is important to note that while Malaysia has managed to reduce absolute poverty, almost 83 per cent of its citizens still earn less than US$10 a day, with only 3.4 per cent earning in excess of US$20 a day in 2004.

Figure 15 Population share by daily income category for Malaysia, 2004

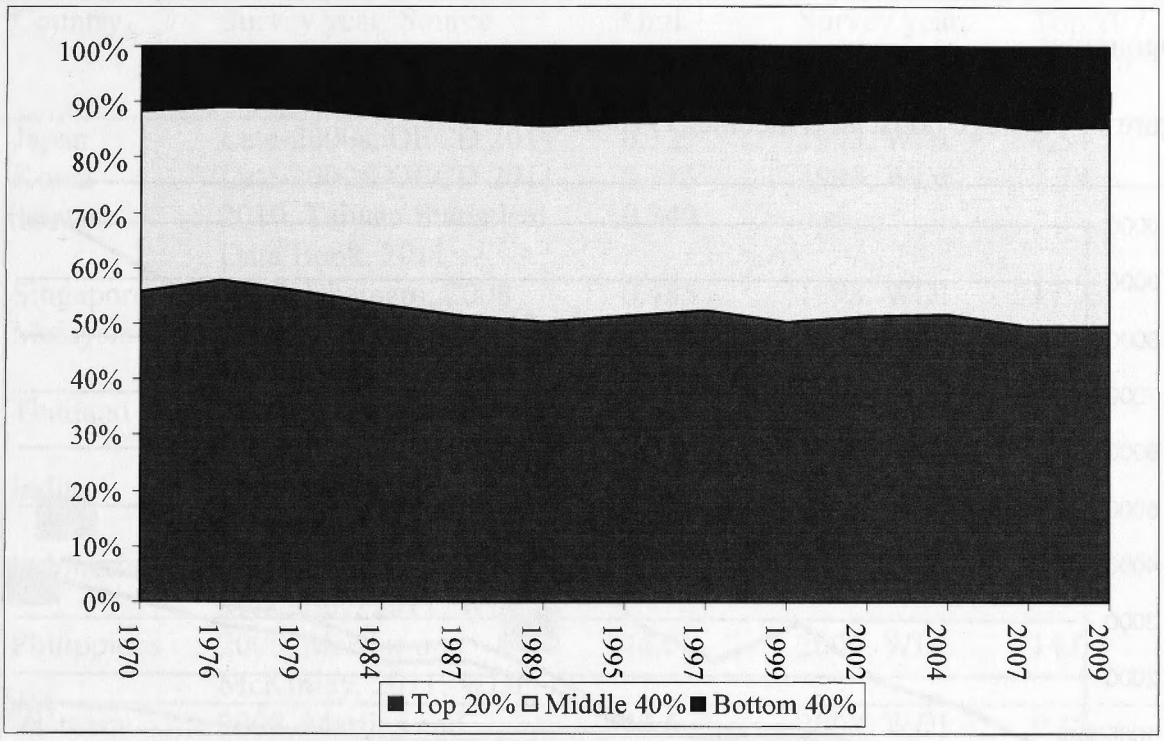


Note Daily income in 2005 Purchasing Power Parity (PPP) $.

Source Adapted from Chun, (2010).

Figure 16 sets out the income shares held by different quintiles of the population. These data confirm, in a different way, what was shown, in Figure 15: that the majority of Malaysians (or approximately 87 per cent of total household) are in the middle three quintiles and that there has been very little change in Malaysia over the 17 years surveyed. The number of people in the top quintile fell by 0.1 percentage point while the bottom 20 fell by 1.4 per cent. The three quintiles in the middle experienced a marginal increase. This raises several interesting questions on the nature of economic growth and its distributional impact in Malaysia.

Figure 16 Income share by households



Source Ragayah, (2011).

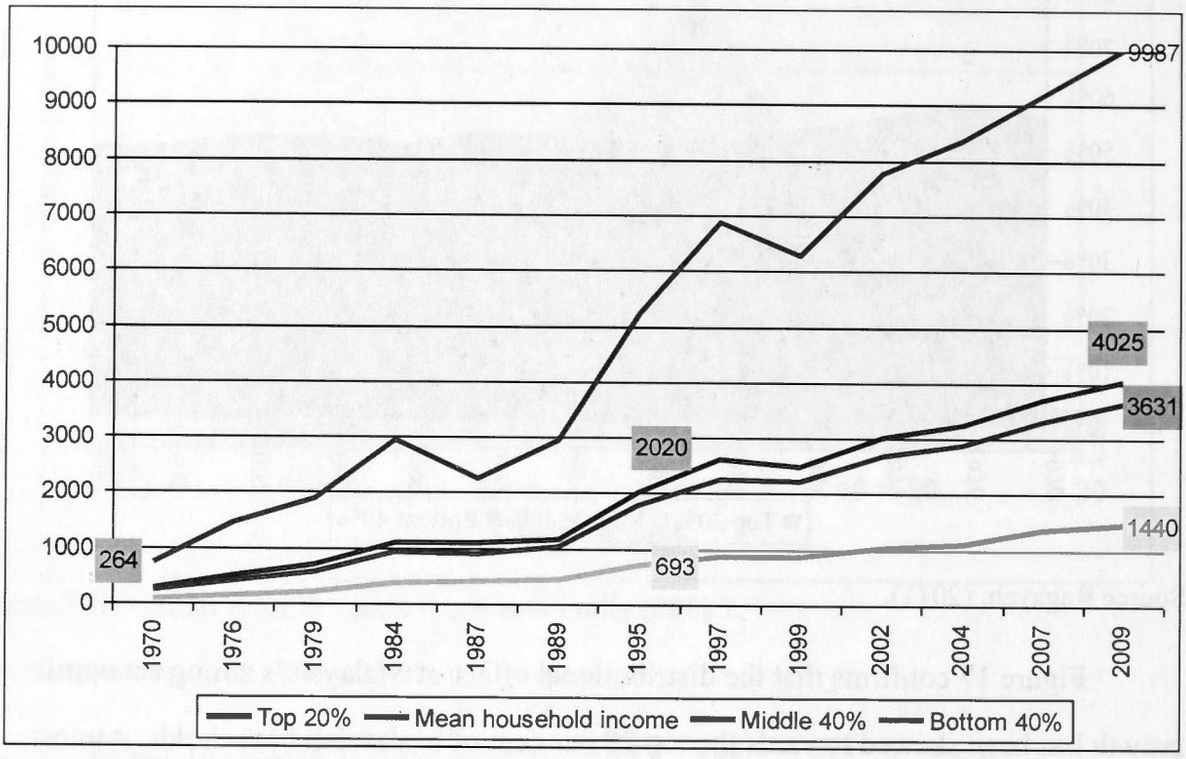
Figure 17 confirms that the distributional effect of Malaysia's strong economic growth has been skewed towards the top 20 per cent of Malaysian households. Almost 50 per cent of income is captured by the top 20 per cent of households in Malaysia while the middle 40 per cent has 36 per cent of the income and the bottom 40 per cent has only 14 per cent of total income. This trend has been consistent since the 1970s.

This observation is reflected in the mean monthly income for households in the three groups. The mean monthly income for the top 20 households in Malaysia was RM9986[47] in 2009 while the mean monthly household income for all groups was RM4025. More than 80 per cent of Malaysian households had mean monthly incomes that were below this line. The mean monthly income for the bottom 40 per cent of Malaysians was RM1440 and the middle 40 per cent was RM3631. What is of interest is that the ratio of the top 20 to the bottom 40 had only been reduced marginally, from

[47] RM9986 is approximately US$3295.17; RM4025 = US$1328.16; RM3631 = US$1198.15 and RM1440 = US$475.17, if the exchange rate is set at RM1=US0.3300

approximately 10:1 in 1970 to 7:1 in 2009 despite extensive income redistribution programmes.

Figure 17 Average household income, 1970-2009



Source Ragayah, (2011).

MALAYSIA – INCOME INEQUALITY IN PERSPECTIVE

Malaysia's income inequality outcomes are higher than all of its comparators, except for Singapore and Thailand, when the Gini index is used as a measure of income inequality, but highest when using the ratio between the highest and bottom 10 per cent as the measure. The OECD countries all have Gini indexes that are below 0.4. Although these numbers are not directly comparable (for example the year of the surveys used are different), they provide context and a compelling reason for analysis the situation in Malaysian.

Table 26 Gini index for selected comparators

Country	Survey year, Source	Gini coefficient	Survey year, Source	Top 10 / Bottom 10*
Japan	Late-2000s, OECD 2011	0.329	1993, WDI	4.54
Korea	Late-2000s, OECD 2011	0.315	1998, WDI	7.79
Taiwan	2010, Taiwan Statistical Data Book, 2011	0.340	n.a	...
Singapore	2007, Dhamani, 2008	0.485	1998, WDI	17.73
Malaysia	2009, Martins and McKinley, 2011, WDI	0.462	2009, WDI	19.49
Thailand	2009, Martins and McKinley, 2011, WDI	0.536	2005, WDI	12.74
India	2005, Martins and McKinley, 2011, WDI	0.368	2005, WDI	8.54
Indonesia	2009, Martins and McKinley, 2011, WDI	36.8	2009, WDI	9.14
Philippines	2006, Martins and McKinley, 2011, WDI	44.0	2006, WDI	14.06
Vietnam	2008, Martins and McKinley, 2011, WDI	37.6	2008, WDI	9.35

Note 1 – World Development Indicators, *Ratio of the income share of the top 10 per cent over the bottom 10 per cent

Source various.

EXPLAINING INCOME INEQUALITY

Theory and evidence in the literature both suggest that high levels of income inequality in developing countries affects growth through three channels: (i) through interaction with incomplete and underdeveloped markets for capital and information; and (ii) by discouraging the evolution of the economic and political institutions associated with accountable government which in turn enables a market environment conducive to investment and growth; and (iii) by undermining the civic and social life that sustains effective collective decision-making (Birdsall 2007). Furthermore, widening gaps in the wage structure manifest themselves in family income and consumption inequality and associated social problems (Autor and Kats 1998). These issues are also being experienced in Malaysia. In particular, the nature of Malaysia's economy, especially in the manufacturing sector, which has been fully liberalised, could

lead to income inequality caused by international trade, via technological change or more specifically, skills-biased technological change.

Technology

The skills-biased technology change hypothesis is based on the proposition that a shift in production technology favours skilled over unskilled labour by increasing its relative productivity, and therefore its relative demand (Berman 1994; Machin 2001; Violante 2005). Conversely, low-skilled workers either lose their jobs or have their wages cut as new technologies are introduced. Hence the wage gap increases as the relative wages (and employment) of the high-skilled workers increases due to skills-biased technological change.

Traditionally, technical change was viewed as factor-neutral. The observed rapid rise in the relative wages of skilled workers in conjunction with an upward trend in their relative supply suggests, however, that recent technological changes have been skills-biased. Theory and empirics both suggest that new technologies (for example, information and communication technologies) are complementary with skilled labour, at least in their adoption phase. There is ample micro-econometric research and several case-studies that document the statistical correlation between the use of new technologies, like computers, and either the employment share of skilled workers (Bartell and Lichtenberg 1987) or their wage share (Autor et al. 1998) across industries.

There are several hypotheses in the literature that provide the foundation for believing that technical change is skills-biased (Acemoglu 2002; Aghion 2002; Hornstein et al. 2005). The first hypothesis is built on the sharp decline of the constant-quality relative price of investment equipment (Gordon 1990; Greenwood et al. 1997), especially evident in information technologies where prices fall every year. Krussel et al. (2000) argue that substantial cheapening of capital equipment is the force behind skills biased technical change. Giriliches (1969) in turn set forth in motion empirical papers that supported the idea that skilled labour is more complementary to capital

equipment than is unskilled labour. As a result of capital-skill complementarity in production, the faster growth of the equipment stock pushed up the relative demands for skilled labour and in turn the skills premium.

The second hypothesis is inspired by the Nelson-Phelps view of human capital. Nelson-Phelps (1966, p. 70) noted that, 'educated people make good innovators, so that education speeds the process of technological diffusion'. In particular they contend that more educated people and able or experienced labour deal better with technological change. Skilled workers are less adversely affected by the turmoil created by major technological transformations since it is less costly for them to acquire the additional knowledge needed to adopt a new technology. Rapid technological transitions – such as witnessed in the past three decades and likely are likely to continue in the future – are skills biased, as more able workers adapt better to change (Greenwood and Yorukoglu 1997; Caselli 1999; Galor and Moav 2000).

The Nelson-Phelps conjecture implies that the rise in the skill premium is transitory. It is only in the early adaptation phase of a new technology that those who adapt more quickly can reap some benefits. As time goes by, there will be enough workers learning how to work with the new technology to offset the wage differential. The significant difference between the first and the second formulation is that the effect of capital deepening on the skill premium is permanent in the first.

The third hypothesis is that information technologies reduce the costs of data storage, communication, monitoring and supervising activities within the firm and that triggers a shift towards new organisational design (Milgrom and Roberts 1990). In particular, the layers in hierarchical structures can be reduced, so that organisation of the firm becomes 'flatter.' Workers no longer perform routinised, specialised tasks but they are now responsible for a wide range of tasks within teams. Therefore, adaptable workers who have general skills and who are more versed with multi-tasking activities benefit from this transformation. Hence, the change in technology induces an organisational shift which is skills-biased. Microeconomic evidence consistent with all

these hypotheses of the technology-skill complementarity hypothesis is offered by Autor et al. (2003).

There are other reasons for skills-biased technical change. Firstly, the direction of technological change favours skilled workers. Profit incentives of innovators determine the amount of R&D activity directed towards different factors of production (Acemoglu 1998). The expansion of educated labour since post-war in the developed economies, and in many former colonies after independence, and the expansion of global trade made it profitable to develop the complementary of machines to skilled workers. Secondly, labour institutions that keep wages high despite reductions in productivity also induce firms to direct efforts towards labour-saving technologies which again favour skilled labour.

Trade

The argument that trade is responsible for the increase in wage inequality stems largely from Heckscher – Ohlin theory (Wood, in Arestis and Eatwell 2008). According to this theory, countries specialise in the production of those commodities which use intensively the factors of production with which they are abundantly endowed. Developing countries that are abundant in unskilled labour but scarce in skilled labour tend to export goods that are intensive in the former. Developed countries export skill-intensive commodities. Under such specialisation, trade expansion results in predictable inequality trends.[48] In the poor country – where abundant unskilled labour is cheap and scarce skilled labour is expensive – trade expansion drives up demand for unskilled labour and drives down the demand for skilled labour, thus erasing some earnings inequality. In the rich country (where relative to the poor country, unskilled labour is expensive and skilled labour is cheaper) trade expansion drives up the demand for the skilled labour and drives down the demand for the unskilled labour, both assuming that

[48] While the results are clear in a comparative static context, it is not so clear in a dynamic context.

labour markets are efficient and flexible. If there is any wage rigidity especially for unskilled labour, unemployment would result.

Conventional trade theory also predicts that the increase in exports of goods intensive in unskilled labour, due to improved transport and rapid growth in East Asia in the past three decades, might explain the rise in skilled-wage differentials observed in capital rich countries such as the UK and the US. A growing empirical literature has tried to sort out how much of the increase in the skill premium can be explained by trade within newly industrialising countries as opposed to alternative explanations such as skilled biased technical change. Trade between high-skill and low-skill economies should cause an increase in the demand for domestic skill-intensive commodities in the high skill economy at the expense of the demand for domestic unskilled intensive commodities. This in turn would induce a reallocation of labour **between** low-skill and high-skill industries. In contrast, skill-biased technical change would induce a shift in labour demand towards skilled labour **within** all industries.

Berman, Bound and Giriliches (1994) tested this hypothesis in the United States and found the **within component** to be the most important. It accounts for 70 per cent of the rise in the white collar share in employment between 1979 and 1987. Using a similar method for the UK between 1979 and 1990, Machin (1996) reports that 82 per cent of the increase in the non-manual share is due to **within industry** shifts. Hence only a minor part of the shift away from manual/blue-collar workers to non-manual/white-collars is due to reallocation of skilled labour between industries.

While these studies confirm that skills-biased technical change as part of the wage inequality story, the fact that the shift in labour demand has taken place mainly within industries is not a sufficient condition to disregard international trade as a factor in explaining the observed increase in wage inequality between skilled and unskilled labour. These arguments rely critically on the assumption that traded goods are primarily final goods and consequently, international trade would shift demand from

unskilled-intensive to skill-intensive goods. If this assumption was changed from final goods to inputs into further production, the implications would be very different.

A lower price of intermediate goods would shift the demand for other inputs, increasing demand for factors of production that are complementary and reducing the demand for substitutes. If unskilled labour were more substitutable for intermediate goods than skilled labour, cheap intermediate goods would increase the demand for skilled labour, shifting the within-industry labour demands to all industries that use such inputs, irrespectively of whether they are skilled or unskilled-labour intensive. In this scenario, international trade that reduces the price of intermediate goods would shift relative labour demands but not the demand for final goods. One cannot therefore interpret the evidence of an absence of between-industry shifts as refuting the role of trade (Aghion et al. 1999). Evidence for this is provided by Falk and Koebel (1997) and Koebel (1997) as they find that unskilled labour is more substitutable for material inputs than skilled labour in the manufacturing and construction sectors in Germany.

Migrant labour

Malaysia is currently the largest importer of migrant labour in Asia. The amount of registered migrant labourers increased from 3.2 per cent of the labour force in 1990 to 21 per cent in 2008 (Athukorala and Devadason 2011). This does not take account of the number of irregular migrant workers who are estimated to total conservatively 2 million people[49] or approximately 17 per cent of the labour force.

The impact of migrant labour on domestic wages is well researched for developed economies. The possible impact of migrant labour on wages and employment outcomes for domestic workers at the most basic level involves a simple analysis of supply and demand. This supply and demand model rests on a key assumption: about

[49] The number of irregular migrant workers is estimated to be between 2 to 3 million. A recent amnesty programme (6P) for irregular migrant workers saw 2.3 million foreign workers registered of which 1.3 million were irregular', 'Myanmar and Malaysia to swap detainees', Martin Carvalho, Yuen Meikeng, Rahimy Rahim and Calvin Yeo, 18 October 2011, The Star.

whether or not migrant labour is perfectly substitutable with domestic labour (Dustmann et al. 2008).

If migrant labour is assumed to be perfectly substitutable with domestic labour, then in a competitive labour market setting, the wages paid to foreign labour in the importing country are likely to exceed those paid in the sending country wage by an amount just necessary to cover the cost of migration plus a premium for the higher cost of living in the importing country. Once the premium is established, and if this new wage is lower than the going rate in the importing country, then there will be downward pressure on the price of labour in the importing country until an equilibrium is reached, where the price of labour in the importing country is the same as the price in the sending country plus the cost of migration and higher living cost

An alternative view is that migrant labour does not compete with but rather complements domestic labour. This view argues that foreign workers are not perfect substitutes for two important reasons (Kindleberger 1967; Bhagwati 1979). Firstly, foreign workers enter the country primarily to take up occupations shunned by local workers as the growth process generates more attractive employment opportunities or greater preference for leisure. The jobs filled by foreign workers generally tend to fall into three categories which are not mutually exclusive: dirty, dangerous and difficult (3D) jobs, jobs that have tasks that are based on monotonous work processes, and static jobs (dead – end jobs) that do not provide a setting for future career advancement. In essence these jobs are undesirable to domestic labour (Athukorala and Devadason 2011).

Secondly, governments in contemporary times have the autonomy to restrict labour mobility within their territorial borders either at the border or behind the border (Bhagwati 1979; Hatton and Williamson 2005). Irregular migrants do not have the rights to compete directly with the domestic labour. This limits irregular labour to being part of labour that takes up jobs in which domestic labour is uninterested.

This view also suggests that the entry of migrant labour can have a favourable economy-wide impact on overall employment and wage levels in the host country through two channels. Firstly, augmentation of domestic labour supply with migrant labour may yield higher profits, permitting the economy to expand investment and output (Kindleberger 1967). Secondly, migrant labour shifts the demand curve outward for domestic goods and services and this increases the demand of labour further. Hence, it can be concluded that the impact of migrant labour on wages is a question of empirics rather than universally determined.

There is a dearth of literature analysing how migrant labour affects wage inequalities in Malaysia compared to the rich literature on developed economies. Three papers do, however, provide analysis of the various determinants of income inequality that set the stage for the analysis here. In his paper, 'Inequality and determinants of earnings in Malaysia', Milanovic (2006) investigates the changes in inequality of earnings, their determinants and how earnings are influenced by the changes in supply and demand of different types of labour over the 13-year period, 1984-1997. The study provides a number of interesting results on the determinants of wage inequality identified – gender, educational attainment, age, ethnicity, geographical location, type of employer and type of occupation.

The results of the Milanovic (2006) study, although not conclusive, provide three important inputs into the analysis here. Firstly, there are many determinants – eight that are tested in this study – that influence wages in Malaysia. Secondly, despite substantial spending on education and improvement in educational attainment, the rates of return on education remained high during the period1984-1997, suggesting continuing demand for an educated workforce. Finally, there appears to be a bias against women in the private sector in general but in support of the Malaysian Chinese community.

Another relevant study is that, on 'Earnings differentials determinants between skills in the Malaysian manufacturing sector', by Ismail and Ragayah (2003). This paper

attempts to measure the determinants of earnings differentials among three classes of workers categorised by skill (skilled, semi-skilled and unskilled) in the Malaysian manufacturing sector. The authors used data from a survey of 2065 workers in six major[50] industries for the year 1999. The paper estimates the determinants of earning differentials by using the coefficients of the earning functions. The factors are then decomposed into three categories; human capital (education, training, and experience), gender, location and the residual.

Ismail and Ragayah's paper reiterates the findings that differences in labour earnings are determined by skills level, gender, location and types of industries although with different levels of importance. The paper notes that educational level plays a crucial role in determining earnings as well as in explaining the earnings differentials. Other types of human capital, such as training and working experience, are less important in determining the earning levels of the workers. Nevertheless, training appears to be an important determinant of the incomes of semi-skilled and unskilled workers. The decomposition of earnings differences confirms the importance of human capital variables: 41 per cent between skilled and semi-skilled, 19 per cent between skilled and unskilled and 55 per cent between semi-skilled and unskilled. There is also very high divergence among the coefficients when comparing semi-skilled and unskilled and skilled and unskilled. The study does not capture explanations but the authors speculate that they may be related to discriminatory practices. Compared to the Milanovic (2006) study, this study did not find that location and gender were an important determinant of wage differences.

Athukorala and Devadason (2011) analyse the impact of migrant labour on Malaysia. Their study finds that, although migrant workers do suppress manufacturing sector wages, the magnitude of the impact is small. The paper notes that real

[50] The six industries were electrical and electronics, textile, wood-based, transport equipment, food, and chemical industries.

manufacturing wages are tied to the structure and performance of the manufacturing sector.

These three papers highlight that there are many determinants of income inequality in Malaysia and in the manufacturing sector in particular. It is evident from the literature review that human capital (education, training and experience), gender, age, location, occupation, industry, type of firm, level of unionisation, capital intensity, exposure to competition both domestic and foreign, research and development intensity, regulatory framework and several other factors, are all determinants of wage levels in differing significance. The particular interest in this chapter is how trade, technology and migrant workers impact on the wages of skilled, semi-skilled and unskilled workers in the manufacturing sector in Malaysia. The focus is on three key proximate determinants that impact the manufacturing sector (human capital, technology and trade) on income inequality.

MALAYSIA'S MANUFACTURING SECTOR

The manufacturing sector in Malaysia has been seen as a major source of economic growth, economic diversification, technological development, and employment generation. Through these objectives that government has also tagged various affirmative action targets, especially entrepreneurship, employment and equity targets in favour of the Bumiputera community. There is no doubt that the manufacturing has played a leading role in transforming the structure of the Malaysian economy (Jomo 2007; Jomo et al. 1999). Manufacturing has been Malaysia's leading sector since 1989, being the most important sector in terms of contribution to Malaysia's GDP and exports.

Table 27 Malaysia – GDP by economic activities at constant RM 2000 price

Sector	2000	2005	2009e
GDP @ constant 2000 price (RM million)	356,401	449,250	522,001
Agriculture, livestock, forestry and fishery	9	8	8
Mining and quarrying	11	9	8
Manufacturing	31	31	27
Construction	4	3	3
Utilities	3	3	3
Wholesale and retail, hotels and restaurants	13	14	16
Transport, storage and communication	7	7	8
Finance, insurance, real estate and business services	14	15	17
Other services	6	6	6
Government services	6	7	8
Total	104	103	104

Note e – estimates; * the total of the sectors is more than 100 as it has yet to less FISIM (Financial Intermediation Services Indirectly Measured) and add import duties.

Source Department of Statistics, (2012).

The manufacturing sector dominates exports by contributing almost two thirds of Malaysian exports. Within manufacturing, electronics, electrical machinery and appliances dominate with 40 per cent of total manufacturing exports.

Table 28 Gross manufactured exports by sectors and key industries (per cent)

Sector	2000	2005	2008
Manufactured goods	85.2	80.7	74.1
Electronics, electrical machinery and appliances	61.7	52.7	41.8
Chemicals and chemical products	4.0	6.0	6.2
Textiles, clothing and footwear	2.8	2.0	1.6
Manufacture of metal	2.8	4.4	4.4
Optical and scientific equipment	1.8	2.2	2.3
Wood products	1.8	1.3	1.5
Rubber products	1.3	1.3	1.9
Transport equipment	0.8	1.3	1.4
Agriculture commodities	4.8	5.8	9.0
Minerals	7.0	9.3	12.9
Other exports	3.0	4.2	4.0
Total	100	100	100

Source Nambiar, (2010).

The manufacturing sector is also the third most important contributor of employment. It contributes almost 17 per cent of total registered employment in Malaysia. Only the wholesale and retail, hotels and restaurants and government services within the services sector have a larger number of registered employed workers.

Table 29 Malaysia – Number of employed persons by industry

Sector	2000	2005	2009
Total labour force ('000)	9269.2	10,045.4	10,897.3
Agriculture, livestock, forestry and fishery	16.7	14.6	13.5
Mining and quarrying	0.3	0.4	0.6
Manufacturing	23.5	19.8	16.6
Construction	8.2	9.0	9.3
Utilities	0.5	0.6	0.5
Wholesale and retail, hotels and restaurants	19.3	22.8	24.2
Transport, storage and communication	4.7	5.4	5.4
Finance, insurance, real estate and business services	5.1	7.0	8.0
Other services	21.7	4.9	5.2
Government services		15.4	16.7
Total	100	99.9	100

Note Industry classifications have changed twice (2000 and 2008). This table is classified according to the 'Malaysian Standard Industrial Classification' (MSIC) 2000.

Source Department of Statistics, (2012).

Nevertheless, in recent years, the manufacturing sector has seen a decline in its performance both at the macro and micro level. This is evident especially since the East Asian Financial Crisis in 1997-98. The growth rate of the manufacturing sector's gross export value is coming close to a plateau while the rate of growth of manufacturing exports has been trending downwards since the early 1990s (see Figures 38, 39 and 40).

This declining performance is also observable at the micro level. A simple average growth rate (AGR)[51] reveals that the period from 2005-2009, average growth rates for the key indicators in the manufacturing sector slowed down further compared to the 2000-2005 period as reported in Table 30. Another important concern is the significant fall in research and development (R&D) expenditure in 2009 compared to 2005.

[51] The average growth rate (AGR) is the simple average for each of the indicators for the stated period.

Table 30 Key indicators in the manufacturing sector

Key indicator	2000	2005	AGR [a]	2009	AGR [b]
No of establishments	20,455	28,257	6.36	30,607	1.66
Total labour	1,574,797	1,675,163	1.06	1,693,154	0.46
Salaries and wages	26,123,409	32,767,343	4.24	39,397,457	1.06
Value of assets (RM '000)	164,077,385	190,914,471	2.73	195,869,770	0.21
Value added (RM '000)	88,240,323	118,210,257	5.66	138,480,708	1.58
Sales value (RM '000)	428,413,643	636,150,118	8.08	705,046,260	1.28
Export value	226,059,762	283,409,239	4.23	227,307,025	1.23
R&D (RM '000)	683,718	2,363,153	40.94	1,847,411	-7.07
Training costs	222,988	326,801	7.76	462,606	3.36
University degree/above	60,370	94,626	9.46	111,755	1.58
Diploma/STPM/equivalent	137,450	178,633	4.99	198,065	1.53
SPM/SPVM/equivalent/below	1,376,977	1,401,904	0.30	1,383,335	0.24

Note AGR – average growth rate; a – AGR for 2000–2005 and b – AGR for 2005–2009.

Source Department of Statistics, (2011).

Migrant workers are concentrated mainly in the manufacturing, where it is the highest, and also in the agriculture, domestic services and construction sector. It is evident that these are labour intensive industries.[52]

Table 31 Malaysia – Distribution of foreign workers by key sectors (per cent)

Sector	1985	1990	2000	2005	2008
Agriculture 1	50.1	37.7	24.8	26.0	25.0
Manufacturing	6.9	8.8	38.1	32.1	36.0
Construction	15.0	34.4	8.5	15.5	14.0
Non-domestics services	20.3 2	19.1	6.7	8.8	9.0
Domestic services	…	…	22.0	17.6	16.0
Total (%)	95.3	99.5	100.0	100.0	100.0
Total ('000)	212	440	807	1815	2020

Note 1 Includes forestry, fishing and mining; 2 – Includes domestic services; … – Not available

Source Athukorala and Devadason, (2011).

[52] The possible reasons for this outcome are discussed comprehensively in Chapter 7.

Labour in the manufacturing sector can be classified into three broad categories skilled, semi – skilled and unskilled. The Revised International Standard Classification of Occupation (ISCO-88) by the International Labour Organisation (ILO) provides for a standardised definition of occupational classification as reported in Table 32. The Malaysian Standard Classification of Occupation (MASCO) follows this ILO classification.

Table 32 MASCO 2008 skills categories

Skill level	Educational level	Major groups
Fourth (skilled)	Tertiary education leading to a university or postgraduate university degree; Malaysian Skills Advanced Diploma (DLKM) 5 – 8	2. Professions
Third (skilled)	Tertiary education leading to an award not equivalent to a first university level; Malaysian Skills Level 4 or Malaysian Skills Diploma (DKM) Level 4.	3. Technicians and associate professionals.
Second (Semi-skilled)	Secondary or post-secondary education; Malaysian Skills Certificate (SKM) Level 1 – 3	4. Clerical support workers 5. Service and sales workers 6. Skilled agricultural, forestry and fishery workers 7.Craft and related trades workers 8. Plant and machine operators and assemblers
First (Unskilled)	Primary education	Elementary occupation

Source MASCO, (2008).

In this study, skilled workers are those who are classified as managerial and professionals and technical and supervisory. Those in this group are conceptualised to at least have a degree, a diploma and extensive on the job training[53]. Semi-skilled workers are those classified as clerical and related occupation and production workers while unskilled workers are general workers. Table 33 describes the structure of labour in

[53] On the job training is not captured in this analysis.

Malaysia's manufacturing sector in 2000 and 2005. Skilled workers constitute no more than 22 per cent of the manufacturing sector with low skilled (semi-skilled and unskilled) workers dominating. Semi – skilled workers dominate with almost 75 per cent of the workforce with unskilled workers amounting to less than 5 per cent.

Table 33 Skills structure in the manufacturing sector (per cent)

Skills structure	2000		2005	
	Domestic	Foreign	Domestic	Foreign
Total labour (in numbers)	1574797		1675163	
Total labour by citizenship (in percentage)	86.1	13.9	78.1	21.9
Skilled workers (total)	16.5		18.6	
Skilled workers by classification	16	0.5	18	0.6
Managerial and professional	5.1	0.3	6.9	0.3
Technical and Supervisory	10.9	0.2	11.1	0.3
Semi-skilled workers (total)	78		74.44	
Semi-skilled workers by classification	64.7	13.3	53.8	20.64
Clerical and related occupation	6.2	0.03	6.4	0.04
Production/operation workers (Direct)	53.9	11.5	41.1	16.6
Production/operation workers (Contract)	4.6	1.6	6.3	4.0
Unskilled labour (total)	3.5		4.3	
Unskilled workers (by classification)	3.3	0.2	3.9	0.5
General workers	3.3	0.2	3.9	0.5

Source Department of Statistics, (2011).

EMPIRICAL MODEL AND APPLICATION

The dataset of Malaysia's manufacturing sector is at the 5 digit level. It covers 187 industries over a 6 year period from 2000-2005. This dataset enables us to analyse the impact of trade, technology and composition of labour on wage difference in the manufacturing sector in Malaysia for the given time period.

Table 34 Summary statistics of the dataset

Variable	Obs	Mean	Std div
Domestic firms	1059	81.12181	107.5545
Foreign firms	924	11.22511	14.99596
Joint ownership	203	1.596059	0.9822102
Total establishment	1060	90.74434	113.0665
Gross output	1079	2830026	7553661
Cost of input	1079	2285411	6398808
Value of assets	1079	982881.6	2181132
Total labour	1079	8504.781	14599.09
Domestic labour	1079	7001.963	11882.43
Foreign labour	765	294.2235	268.9766
Skilled domestic labour	641	347.8846	271.2153
Skilled foreign labour	962	54.69751	96.33097
Skilled wages	1078	67800.8	135754.5
Semi-skilled domestic labour	1078	4592.956	8149.408
Semi-skilled foreign labour	789	275.5019	265.431
Semi-skilled wages	1078	75302.15	131787.6
Unskilled domestic labour	1079	318.7216	455.5921
Unskilled foreign labour	1069	29.36134	101.6561
Unskilled wages	1078	4760.717	6758.265
Share of R&D/capital	1118	0.0054	0.0117506
Share of exports/sales	1118	0.32444	0.2058766

Several studies have highlighted the widening wage gap between skilled and unskilled workers in developed countries, due to the rising demand for skilled workers as the new technologies used in modern workplaces have altered employers' demand for skills (Machin 2001; Autor et al. 1998; Acemoglu and Autor 2010). Wage gap is defined as the differences in the wages of the skilled and unskilled workers. This is primarily driven by several factors such as (a) skilled biased technological factors that increased the demand for skilled workers relative to unskilled workers, (b) increasing export intensity in skilled and technology based products that increased the demand for the skilled workers, and (c) government policies to structurally adjust the industries to higher value-added activities.

In exploring the explanations behind the wage gap, it is useful to adopt the Supply-Demand-Institutions (SDI) framework that was suggested by Katz et al (1998), where both demand and supply factors affect the wage gap in the labour market. In

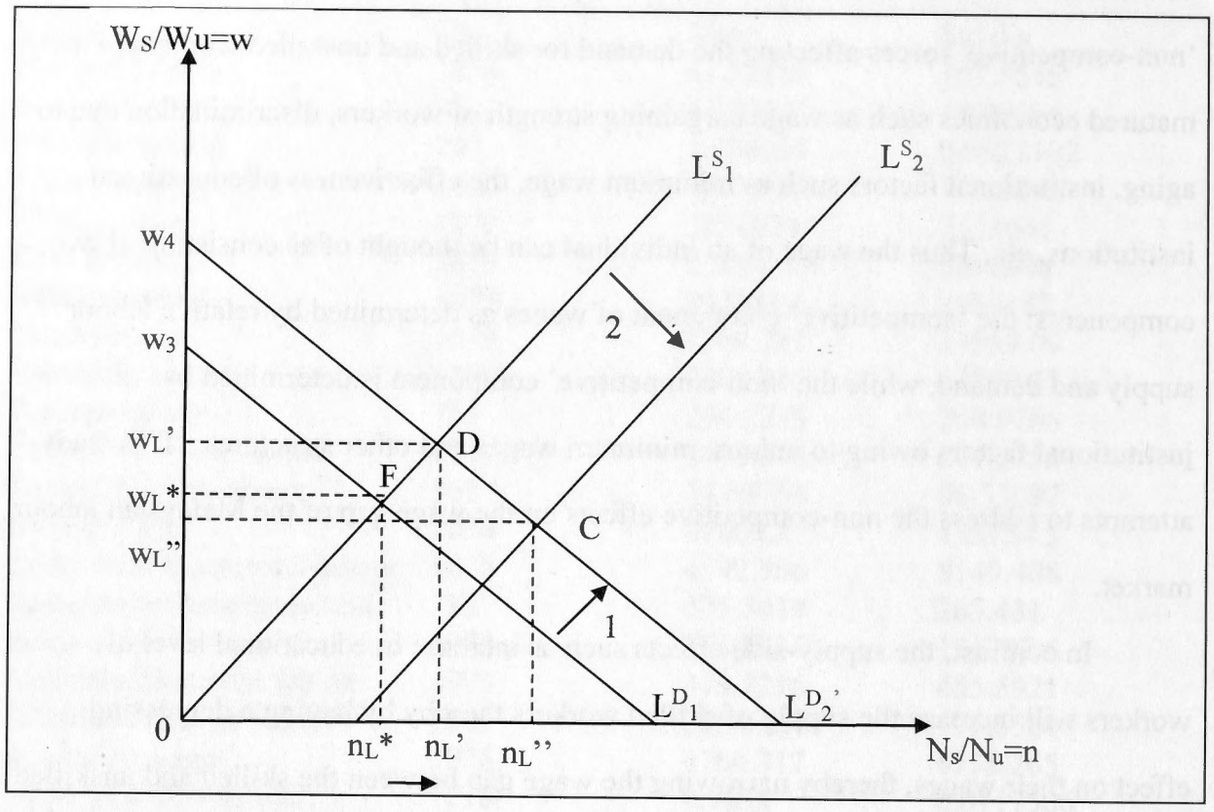
addition to 'competitive' market forces increasing, it is also the observing the effects of 'non-competitive' forces affecting the demand for skilled and unskilled workers in more matured economics such as wage bargaining strength of workers, discrimination due to aging, institutional factors such as minimum wage, the effectiveness of educational institutions, etc. Thus the wage of an individual can be thought of as consisting of two components: the 'competitive' component of wages as determined by relative labour supply and demand, while the 'non-competitive' component is determined by institutional factors owing to unions, minimum wages and other structures. This study attempts to address the non-competitive effects on the wage gap of the Malaysian labour market.

In contrast, the supply-side effects such as increase in educational level of workers will increase the supply of skilled workers thereby by having a depressing effect on their wages, thereby narrowing the wage gap between the skilled and unskilled workers, ceteris paribus. As government improves the higher educational institutions, there should be an expectation of greater supply of educated and skilled workers to enter the labour force, which will reduce the wages of the skilled workers.

However, recent studies of the OECD countries on the wage gap highlight that it has widened in many OECD countries. The wages of the better-skilled workers relative to the low-skilled workers continue to increase despite the relative increase in the supply of the more educated and presumably, more skilled workers in the 1980s and 1990s (OECD 1993; 1996). This implies that demand has risen at a faster rate than supply due to rapid technological innovations spurred by research and development.

The international literature has tended to focus on relative demand shifts to explain the wage gap illustrated through Figure 18.

Figure 18 Technology induced effect on demand and supply of labour



Where w_L relative wage rate for local skilled and unskilled workers

n_L relative local labour force of skilled and unskilled workers

L^S local labour supply

L^D local labour demand without levy

F Initial equilibrium

D new equilibrium with shift in only labour demand

C new equilibrium with shift in labour demand and labour supply

w_L* market-clearing wage

w_L' new market-clearing local wage after shift in labour demand

w_L'' new market-clearing local wage after shift in labour demand and supply

n_L* initial number of local workers employed

n_L' number of local workers employed after shift in labour demand

n_L'' number of local workers employed after shift in labour demand and supply

Point D Relative wages increases due to shift in labour demand due to increase demand for skilled workers as new technologies are introduced.

Point C Relative wages falls due to shift in labour demand and supply. The supply shift due to technology inducement effect is stronger than the shift in labour demand.

To implement the model empirically, this study adopts the industry wage equation framework of Allen (1996) and applies it to the Malaysian labour market by creating a panel of 189 industries from 2000 to 2005. The industry wage equation framework of Allen (1996) is modified to study the wage gap at the industry level for the Malaysian economy. The modified model is given in the following equation (log form):

$$\ln(\text{Wage of skilled} - \text{Wage of Unskilled})_{it} = a_0 + a_1 \ln(\text{share of skilled types of foreign to local workers})_{it} + a_2 \ln(\text{Fixed Assets}) + a_3 \ln(\text{Value-Added Output})_{it} + a_4 \text{Time Trend} + w_t + u_i + e_{it} \quad (1)$$

where industry=i……., , and time=t…….

ln(Wage of skilled –Wage of Unskilled)$_{it}$ = wage gap between skilled and unskilled local workers;

ln (share of skilled types of foreign to local workers)$_{it}$ = share of skilled, semi-skilled and unskilled foreign workers to local workers

ln (Fixed Assets)$_{it}$ = capital accumulation effects and structural changes from capital accumulations

ln (Value-Added Output)$_{it}$ = the output and scale effects in the economy

The model was estimated by pooling the cross-section and time-series data consisting of 189-digit industries from 2000 to 2005. The model was estimated with the fixed-effect framework that accounts for both the industry and time specific effects.

EMPIRICAL FINDINGS

The graphical relationship between skilled, semi-skilled and unskilled workers to wage gap are given in Figures 41 to 43[54]. A negative relationship is observed between the share of skilled foreign to local workers and wage gap as illustrated in Figure 41. This indicates that a greater inflow of skilled foreign workers tends to reduce the wage gap in the manufacturing sector. In contrast, the wage gap tends to show a positive relationship with the share of unskilled foreign workers as illustrated in Figure 43. The wage gap widens with greater in-flow of unskilled workers. No distinct relationship is observed between wage gap and the share of semi-skilled foreign workers as illustrated in Figure 42.

The results of the model are reported in Table 35 for OLS, fixed and random effect estimations. As OLS estimation is biased due to industry effects, estimations with fixed and random effects are also undertaken. The results are consistent across the fixed and random effect estimation.

Table 35 Wage gap between skilled and unskilled workers in the Malaysian manufacturing sector 2000-2005

Variable	OLS	Fixed-Effects	Random-Effects
ln (share of skilled foreign to local workers)$_{it}$	-0.043***	-0.051	-0.016
	(-3.010)	(0.630)	(-0.351)
ln (share of semi-skilled foreign to local workers)$_{it}$	0.254***	0.032	0.066
	(2.540)	(0.410)	(0.900)
ln (share of unskilled foreign to local workers)$_{it}$	0.061***	0.025***	0.031***
	(5.160)	(3.200)	(3.960)
Ln (Fixed Assets)$_{it}$	-0.090**	0.169***	0.083*
	(-1.820)	(2.710)	(1.650)
Ln (Value-Added Output)$_{it}$	0.0294***	0.088*	0.058
	(6.230)	(1.650)	(1.170)
Constant	0.980	1.370***	0.380

[54] See Appendix 3.

	(2.580)	(2.930)	(1.010)
R-Square	0.190	0.110	0.184
Observations	530	530	530

The results are interesting on several counts. The increase in the share of skilled foreign workers to local workers tends to reduce the wage gap between the skilled and the unskilled. This may be due to the supply-side effects as the number of skilled foreign workers increased in the domestic economy. In contrast, the increase in unskilled workers in the economy tends to increase the wage gap as the increase in supply of unskilled foreign workers tends to depress the wages and increase the gap between the skilled and unskilled. As the Malaysian economy transits to higher value-added activities, there will be greater pressure for skilled workers and thus putting more pressure on the skilled wages. Furthermore, there is expected hallowing-out as labour intensive industries shift to low cost production. This will have a larger displacement of unskilled workers and will have depressing effects on the unskilled wages. Again, this will increase the wage gap between the skilled and unskilled.

The share of semi-skilled foreign workers has a positive but a not statistically significant impact on the wage gap. It was also observed that increasing capital investments tend to increase the wage gap. As new capital investment in machinery and technologies in the manufacturing industries increases, it will increase the demand for skilled workers and hence increase the wage gap between the skilled and unskilled. This coefficient is robust to both the fixed and random effect estimation. It was also observed that increase in output has a positive impact on wage gap. This again reflects the likely increased demand for skilled workers as output in the manufacturing sector increases.

The impact of technology and exports on the wage gap was examined by inter-acting the share of skill types of workers with R&D expenditure and share of exports respectively. The results are given in Table 36. It is interesting to observe that the skilled share, and in particular the share of semi-skilled foreign workers, increased the wage gap. This is mainly due to the structural adjustment of the economy to higher

value-added activities. The results clearly indicate that technology is not the cause of a widening wage gap in the Malaysian manufacturing sector as the R&D interactive term is not statistically significant. In contrast, the export and trading activities are the main source of the widening wage gap in the economy.

The interactive terms of exports and share of semi-skilled foreign workers tend to negative, thereby indicating that a greater flow of semi-skilled foreign workers narrows the wage gap between skilled and unskilled workers. In contrast, trade and export activities tend to increase global competition and greater inflow of foreign unskilled keep the cost of production low. Increases in unskilled foreign workers widen the wage gap in the manufacturing sector. Greater competition will also increase the pace of structural adjustments and increase the value-added activities in the economy. The hollowing-out effect, where low technology and labour intensive industries will relocate to low cost countries, will also increase the lay-off unskilled workers increasing the supply of unskilled workers in the economy, thereby increasing the wage gap.

Table 36 Wage gap between skilled and unskilled in the Malaysian Manufacturing Sector 2000-2005

Variable	Fixed-Effects	Random-Effects
ln (share of skilled foreign to local workers)it	-0.009	-0.035
	(-0.240)	(-0.830)
ln (share of semi-skilled foreign to local workers)it	0.188***	0.057
	(2.200)	(0.660)
ln (share of unskilled foreign to local workers)it	0.008	0.259*
	(0.520)	(1.690)
ln(Net Fixed Assets)it	0.08*	0.162**
	(1.600)	(2.670)
ln(Value-Added Output)it	0.063	0.080
	(1.270)	(1.430)
ln (share of skilled foreign to local workers)it*ln(R&D Expenditure) it	0.130	2.491
	(0.040)	(0.480)
ln (share of semi-skilled foreign to local workers)it*ln(R&D Expenditure) it	-0.200	-2.120
	(-0.250)	(-0.340)
ln (share of unskilled foreign to local workers)it*ln(R&D Expenditure) it	2.714	0.011
	(0.440)	(0.010)
ln (share of skilled foreign to local workers)it*ln(Share of Exports) it	-0.004	-0.064
	(-0.060)	(-0.930)
ln (share of semi-skilled foreign to local workers)it*ln(Share of Exports) it	-0.522***	-0.438***
	(-3.810)	(-2.560)

ln (share of unskilled foreign to local workers)it * ln (Share of Exports) it	0.127*** (2.910)	0.166*** (3.810)
Constant	0.385 (0.990)	1.390*** (2.880)
R-Square	0.219	0.112
Observation	530	530

These findings raise fundamental questions about whether Malaysia's current race-based affirmative action policies are suitably geared to addressing income inequality in the manufacturing sector in general, and especially within the context of overcoming the middle-income trap. As discussed, overcoming the middle-income trap requires further specialisation of industries, firms, products and geographical areas. If government strategies in human capital development and income inequality during the catch-up phase and rapid growth had failed, continuing these strategies to overcome the middle-income trap is clearly unwise.

CONCLUSION

The consensus view, as discussed in Chapter 1, is that for Malaysia to return to high growth path, there is a critical need to upgrade the manufacturing sector towards higher value added production and processes.

The results here suggest that human capital accumulation is crucial for development of Malaysian economy. In particular, the increase in human capital will complement technology adoption in the manufacturing sector; it will also have a positive impact in narrowing the wage gap between the skilled and unskilled if the supply-side effects of increasing the educated and skilled workers are sufficiently strong. In this respect, education and training institutions play an important role in creating the appropriate skills and human capital in the economy.

However, the focus on human capital development alone is insufficient. The results also indicate that as the economy structurally adjusts to higher value-added activities, there will be greater displacement of unskilled workers. This is expected to

widen the wage gap and depress the wages of the unskilled. As Malaysia faces greater global competition from other rapidly developing economies such as China, India and Vietnam, Malaysia can expect greater 'hollowing-out' effects as the economy structurally adjust to higher value-added activities. The implication is that Malaysia should expect a widening of the wage gap between the skilled and unskilled local workers in the future. This has great implications on the competitiveness and sustainability of long-term growth of the Malaysian economy as the level of income inequality and poverty in the economy will increase. This will increase the social and economic burden on the economy.

The results of the study indicate that trade and exports have more important impact on the widening wage gap in the Malaysian manufacturing sector. As the manufacturing sector is expected to maintain its cost competitiveness, the flow of unskilled foreign workers is expected to keep the cost down for the export sector. There is no observation of any statistically significant impact from R&D activities in the economy. Thus, there appears to be little impact from technology on the wage gap. This may be due to very low innovative activities in the manufacturing sector. As the competition from the export sector increases, it is expected that the wage gap between the skilled and unskilled workers will widen.

The results also highlight the importance of managing foreign workers in the economy. As the share of unskilled foreign workers increases in the domestic economy, the wages of the unskilled workers will be depressed and the wage gap will widen. This has important implications for the employability of local unskilled workers.

Developing educational and training institutions is an important strategy to develop human capital. More importantly, life-long learning of the workers is also now an imperative. Workers have to constantly update and up-skill to remain relevant and competitive in the labour market. Developing strong educational and training institutions that allow for seamless upgrading of skills is very relevant. The policy leverage in terms of higher educational attainment and training of local workers is

expected to have the technology inducement effects to acquire higher skilled levels and education. The results suggest that the technology inducement effects will narrow the wage gap between skilled and unskilled workers. This is therefore the key policy lever to narrow the wage gap and increase the competitiveness in the domestic economy.

These finding raises fundamental concerns about whether Malaysia's current strategies to address income inequality through human capital development policies which are race-based are suitably geared towards addressing income inequality in the manufacturing sector in general, and especially within the context of overcoming the middle-income trap?

These issues are addressed in the institutional analysis in Chapter 7.

Chapter 7 What's wrong with human capital development in Malaysia?

> But compared to other countries – both in the region and developed countries worldwide – the quality of students being produced… continues to be inadequate. Educational policies have stymied the national objective of producing the best talent to meet the country's needs.
>
> NEAC (2010a, p. 55)

> Malaysia cannot compete globally if the education system produces graduates and workers that are technically ill-equipped for a competitive global market.
>
> NEAC (2010b, p. 4)

The lack of an appropriate institutional architecture for upgrading knowledge and technology appears to be one important reason for the reliance on low cost labour and increasing inequality in the manufacturing sector. This failure is caused by perverse incentives, a product of economic and political factors, in addressing market failures associated with knowledge generation, human capital development and technological upgrading in the manufacturing sector. This chapter provides an institutional analysis of this problem to explain the findings of the empirical analysis in Chapters 5 and 6. The chapter also identifies the current institutional weaknesses in human capital development and managing income inequality in Malaysia.

INSTITUTIONS, HUMAN CAPITAL DEVELOPMENT AND INCOME INEQUALITY IN THE MANUFACTURING SECTOR

The chapter advances three institutional reasons behind the manufacturing sector's reliance on low skilled labour and rising income inequality. The first is the failure of educational and training institutions to produce the required quantity and quality of skilled labour. The second is the failures of firms in the manufacturing sector to train and retrain its workers to either upgrade their skills or provide a new set of relevant skills. The third reason is attributed to government policies that undermine

efforts by firms and individuals to invest in human capital development. Potentially, all these have a detrimental impact on income inequality between low and high skilled labour in the manufacturing sector.

Educational institutions[55] are responsible for supplying the country with the required quantity and quality of labour with explicit knowledge and skills. This supply and demand is coordinated at various institutional levels through various mechanisms by government, private and intermediary organisations.[56]

Firms in the manufacturing sector, individually, or through collaborative efforts with other firms (private sector linkages) and/or with the public sector or other intermediary institutions (public-private sector linkages) are responsible for the human capital development of their employees. This network of institutions is responsible for the supply of explicit, tacit and implicit knowledge or general and specific skills that are embodied in labour through learning by doing. This supply is developed within a firm through complex interaction determined by the density and cohesion of networks that the firm is part of.[57]

Finally, government policies that influence the demand and supply of labour in Malaysia are also responsible for the outcomes of low human capital development and income inequality in the manufacturing sector. The labour market (Level 2 –

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[55] For a discussion on how institutions are classified in this thesis, please refer to Chapter 3 which provides a detailed treatment of the institutional mapping.

[56] The relevant components intersect all institutional levels from Levels 1 to 5. Institutions (Level 1) includes norms, rules, conventions, habits and values; institutional arrangements (Level 2) includes the role of markets and states in the provision of education and training; institutional sectors (Level 3) include the system of education; organisations (Level 4) players such as the Ministry of Education, public, private and non-profit schools, colleges and universities both general and technical that provide education and training; while outputs and performance (Level 5) are policies that determine the nature, quantity and quality of the system of education such as the content of the curriculum, the availability of places in institutes of learning and training, fiscal incentives, staffing policies, the accreditation process and many other policies, statutes and administrative decisions that influence human capital development in Malaysia.

[57] To illustrate this, the institutions involved are institutional arrangements (Level 2) such as the relationship between state and markets, networks, associations and communities; institutional system (Level 3) such as system of research; organisations (level 4) such as firm, chambers of industry and commerce, universities and R&D institutions, skills development centres; and government agencies; outputs and performance (Level 5) such as government policies to promote innovation, to promote linkages between the private and public sector but also among private sector participants.

institutional arrangement) is the focus but related institutions such as organisational level human resource policies (Level 2), immigration policies on foreign workers and active repression of trade union activities in the manufacturing sector (Level 5 – outputs and performance) impact on the quality of human capital supplied and demanded.

Five important characteristics are used to analyse the effectiveness of the institutions when addressing human capital development and income inequality. These five institutional characteristics were put forward by Rasiah (2002) and Rasiah (2005) who built on the work pioneered by Best (2001) to explain the effectiveness of integrated cluster networks in technological upgrading in Malaysia. First, effective systemic coordination and network cohesion is necessary to stimulate demand-supply conditions for the creation and appropriation of knowledge through formal educational institutions as well as firms. Secondly, institutions enjoying cohesion and connectivity are important to ensure continuous growth of supplier chains intersecting global value chains with domestic production. Thirdly, these institutions facilitate the leveraging of tacit and implicit knowledge of individuals (entrepreneurs, managers, labour) within the sector allowing for the further specialisation of labour. Fourth, a critical mass of technical personnel, R&D engineers and scientists are essential to enable firms' effective participation in technological upgrading and innovative activities. Finally, institutions that promote open national frameworks through selective immigration policies facilitate the ability of firms to overcome challenges that are associated with human capital or technology deficiencies.

The rest of the chapter is organised into three sections. Each section discusses one of the three reasons identified in the beginning of this section as the proximate cause for the manufacturing sector's use of low skilled labour and rising income inequality. These three reasons in turn are evaluated, using the five characteristics outlined by Rasiah (2002; 2005) and Best (2001) which was discussed in the preceding paragraph. The chapter concludes by identifying the key institutional weaknesses that

will need to be addressed if Malaysia wants to develop the human capital required to overcome the middle-income trap.

Income inequality and human capital development

Despite significant advance in the overall welfare of all Malaysians in terms of levels of income, but also extensive and comprehensive scope of race-based affirmative action, and the extended period (43 years and counting) for the Bumiputera community, this study confirmed well-trodden grounds that affirmative action had not addressed income inequality in Malaysia nor assisted the Bumiputera community in achieving parity with non-Bumiputeras. A comprehensive study by Muhammad (2011) on the distribution and inequality of wealth using Malaysia's 2007 Household Income Survey (HIS2007) finds that an average Bumiputera has about one month of financial reserve to cover his/her monthly expenditure in case of loss of income or employment. About 93 per cent of Bumiputera households have no savings, and about 66 per cent have no financial assets. About 72 per cent of Malaysians who are without wealth are Bumiputeras when compared to only 17 per cent Chinese and 10.7 per cent Indians. The study also validated the existing consensus that distribution of wealth is highly skewed, with the top 10 per cent of Malaysian household per capita controlling 35 per cent of the country's wealth, while the bottom 40 per cent owning only 8 per cent. It is evident that the government's focus on corporate wealth and income measurements are not reflective of the economic well-being of an average Malaysian household, especially for the Bumiputeras.

Income inequality and government-linked corporations

Government-linked companies/corporations (GLCs) are defined as companies that have a primary commercial objective and in which the Malaysian Government has a direct controlling stake. Controlling stake refers to the Government's ability (above and beyond the percentage of ownership) to appoint members to the Board Directors, senior management, make major decisions (e.g. awarding of contracts, strategies,

restructuring and financing, acquisitions and divestments, etc.) for GLCs directly or through government-linked investment companies (GLICs) which act as holding companies for GLCs.

The GLICs are defined as Federal Government linked investment companies that allocate some or all of their funds to GLC investments. The Federal Government influences GLICs in the same way it influences GLCs, by appointing and approving board members and senior management, and having these individuals report directly to the government as well as in providing funds for operations and/or guaranteeing capital and in some cases, income, placed by unit holders.

There are currently seven GLICs: Kumpulan Wang Simpanan Pekerja (KWSP/EPF – Employees Provided Fund), Khazanah Nasional, Kumpulan Wang Amanah Pencen (KWAP/RFI – Retirement Fund Incorporated), Lembaga Tabung Angkatan Tentera (LTAT/AFFB-Armed Forces Fund Board), Lembaga Tabung Haji (LTH-Pilgrims Fund Board), Ministry of Finance Inc., and Permodalan Nasional Berhad (PNB). The total numbers of GLCs are unknown but from publicly available information, these GLCs as a group employ 5 per cent of the national workforce, account for approximately 36 per cent of the market capitalisation of the Bursa Malaysia (Malaysian main stock exchange), and comprise 54 per cent of the benchmark Kuala Lumpur Composite Index (KLCI).

Existing studies from a financial perspective highlight the fact that non-GLCs outperform the GLCs (Lau 2008; Najid and Rahman 2011, CIMB 2011) but also to Singapore's GLCs (Lye 2011). They have also contributed to the government's fiscal burden. This raises the question on the role of the GLICs and GLCs in the Malaysian economy, especially within the context of growth beyond the middle income trap.

The GLICs and GLCs are not only complex entities due to their size, breadth and scope of activities but also because of their secretive nature (Lai 2013). Their objectives are vaguely. GLICs have two overriding objectives: first, to manage the commercial assets owned by the federal government; and second, it was directed to

make 'strategic investments' on behalf of the government that would contribute towards 'national interests' and 'nation building'. However, these phrase – 'strategic investments', 'national interests' and 'nation building' are undefined.

Table 37 Communicated GLIC mandates and priorities

GLIC	Mandate and/or priorities
Permodalan Nasional Berhad	'To enhance the economic wealth of the Bumiputera community in particular and to contribute toward the growth and prosperity of the nation for the benefit of all Malaysians.'
Ministry of Finance Inc.	'Responsible for holding investments on behalf of Government of Malaysia and to manage these investments in line with national interests.'
Khazanah Nasional Berhad	'To maximise shareholder value of investments and to shape selected strategic industries in Malaysia, nurturing their development and doing so with the objective of pursuing the nation's long-term economic interests. Entrusted to explore strategic investment opportunities in new sectors and new geographies.'
Employees Provident Fund	'To provide retirement benefits to its members through efficient and reliable management of their savings. Also committed towards nations socio-economic development through prudent investments.'
Lembaga Tabung Angkatan Tentera	'To provide retirement and other benefits to other ranks of the Armed Forces and to enable officers and mobilised members of the volunteer forces in the service to participate in a savings scheme. To offer retraining for retiring and retired personnel of the Armed Forces of Malaysia.
Lembaga Tabung Haji	'To enable Muslims to save gradually to support their expenditure during the pilgrimage. To enable Muslims to have active and effective participation in investment activities in Islam through their savings. To protect, safeguard interests and ensure welfare of pilgrims during pilgrimage by providing various facilities and services.'
Kumpulan Wang Amanah Pencen	'To assist the government to finance pension payments and other retirement benefits to Malaysian civil servants.

Source: Putrajaya Committee on GLC High Performance, 2006

Not much is known of its antecedents but GLICs and GLCs development were an outcome of the ruling coalition's strategy to drive economic growth that is contingent of the political settlement that they operate within, and the ultimate objective of remaining in power. One key outcome of the May 13, 1969 riots was a shift in relying on markets to deliver on growth and distributional outcomes towards more activist government policies. There are three distinct phase in government involvement in 'business'. The first was through state owned enterprise (circa 1970-19850, the second through private entrepreneurs linked to the ruling coalition, and thirdly, through GLICs & GLCs.

GLICs and GLCs had existed in various other forms in Malaysia since the 1960s. Many of the current GLCs (National Electricity Board, Malaysian Airlines, Wate Department, etc.), were first state owned enterprises that were first privatised to companies or individuals linked closely to the ruling party or were purchased outright on stock markets (Sime Darby). The GLCs and GLICS then were not very visible although critically important to the economy. These GLCs and GLICs came into the national consciousness fully at the onset of the East Asian Financial Crisis in 1997/98 (EAFC) as the government went about bailing out or were companies repurchased from their owners (individuals or companies linked to the ruling party) as they went bust (Malaysian Airlines, Renong, UEM, RapidKL, etc.). As state owned enterprises were already largely discredited far causing a fiscal crisis in the early 1980s, these now privatised firms were recapitalised by GLICs and made into GLICs.

The very first GLICs and GLC reforms dubbed 'transformation programme' started only recently in 2003/04 when the newly minted Abdullah Ahmad Badawi administration attempted to transform these entities from 'bloated and inefficient civil-service like corporations' into entities that not only can hold their own against the private sector but can also be 'regional champions' (CIMB 2011). The 10-year transformation programme had four phases and is currently is its final phase. The first phase spanning 2004/05 involved the revamp of Khazanah and setting key performance

indicators (KPI) for all the GLCs.[58] Phase 2 in 2006 was the launch of 10 transformation manuals and the setting of policy guidelines. Phase 3 which covers 2007-2010 was the period when tangible results are to have emerged, and the final phase which covers 2011 to 2015 is when Malaysia's regional champions are expected to emerge.

The transformation programme is driven by Khazanah, which also played a key role in the formulation of the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP). As part of the New Economic Model (NEM), the GLICs and GLCs have five key roles:

- Diligently staying the course in executing the 10-year GLC transformation programme;
- Relentlessly continuing their journeys to regional champion status;
- Pursuing new economy investment in line with the NEM;
- Collaborating and co-investing with the non-GLC private sector;
- Focusing on core businesses on a level playing field and progressively divesting non-core and non-competitive assets.

Whether these reforms have been successful has yet to be ascertained. Government 'report cards' of the transformation programme paint a glossy picture while independent reports and by the academic sends mixed signals. Furthermore, the opacity within which these GLICs and GLCs operate provides a veil of ignorance on the performance of these GLCs. It is only when scandals occur – which are increasingly regular and at increasingly large record breaking quantum – that the thrust of this study is validated, that reforms that the past and present administration are undertaking are only occurring in the margins, and not where it matters most.

In the ETP, the GLCs are to play a key role in generating growth beyond middle- income trap. However, as this study has demonstrated, the fundamental

[58] Khazanah Nasional is currently the sixteenth and twentieth largest sovereign wealth fund in the world as measured by Monitor Group (2012) and SWF institute (2012).

challenge of the nation has yet to be addressed. The government's strategy with the GLCs appear to be similar of the strategies of the past i.e. picking the winner, with the senior management of the GLCs together with political guidance from the ruling coalition, identifying and pursuing 'winners' and/or 'new growth' areas. The dominant role of the GLCs and their lethargic performance continue to be critiqued by experts (Menon 2012); REFSA 2012) and in the manufacturing sector, the GLCs are either a tax burden (e.g. PROTON) or are generating profits due to behind the borders protection (e.g. Pharmaniaga). None of the GLCs have developed indigenous technological capacity, capability and/or capital in the way the Japanese, the South Koreans, and the Taiwanese. While reasons are multifaceted, this study has demonstrated through the analysis of human capital development in the manufacturing sector that the institutional settings within which these GLCs operate have yet to be reformed. Thus it is not surprising that the GLCs continue to receive mixed reviews, and have been unable to drive growth in Malaysia

INSTITUTIONS, THE PRODUCTION OF EXPLICIT KNOWLEDGE AND HUMAN CAPITAL DEVELOPMENT

The basic challenge that the Malaysian economy faces is n producing and matching the supply and demand of skilled human capital. Stated differently, Malaysia's education system is not producing a sufficient number of people with the correct level of explicit knowledge, and matching these with market demands. More specifically Malaysia's education system is not producing and training a sufficient number of people with the skills, technical and scientific knowledge that are needed in the manufacturing sector. This is exacerbated by similar shortages in the educational, training and research and development institutions that feed into the manufacturing sector.

Comparing Malaysia with the successful East Asian economies provides a snapshot of Malaysia's current situation. Only 5 per cent of Malaysians aged 25 years old and above had tertiary level education compared to 24 per cent in Japan, 17 per cent

in Korea, 11 per cent in Taiwan and 12 per cent in Singapore in 2010. The average years of schooling for a Malaysian 25 years old and over was only 5 years compared to almost 12 years in Japan and Korea, 11 years in Taiwan and 9 years in Singapore. This snapshot provides a starting point to analyse the failure of Malaysia's education system in producing the required stock of skilled human capital.

Table 38 Educational attainment for 25 years and above for selected countries in 2010

Country	Primary	Secondary	Tertiary	Average years of schooling	Average years of tertiary education
Japan	14.1	30.2	23.9	11.48	1.20
Korea	10.2	37.8	17.3	11.64	1.09
Taiwan	11.9	30.9	10.6	11.03	0.91
Singapore	16.7	15.8	12.3	8.83	0.62
Malaysia	12.9	33.8	5	5.16	0.38

Note The Barro-Lee dataset (2011) provides estimates for educational attainment data for 146 countries in five year intervals. It is the most commonly used dataset to measure educational attainment. a – percentage of population aged 25 years old and over that have completed various levels of education (primary, secondary and tertiary); Average year of schooling of population aged 25 years and over for different levels (total, primary, secondary and tertiary) for various years at 5 year interval .

Source Barro-Lee, (2010).

Further investigation into Malaysia's educational system identify a key reason that explains the low stock of skilled human capital as evidenced in Table 39. The transition rate from upper secondary to pre – university and tertiary level is disturbingly low. The participation rates[59] reflect the flow of human capital that contributes towards the stock of human capital. The higher the flow towards the upper reaches of educational attainment, the better the stock of human capital. In Malaysia, only 15 per cent of students within the age group of 17-18 are enrolled in the education system[60]

[59] Participation rates are calculated by dividing the total number of students enrolled in the public education system over the total population in that cohort.

[60] Education system here only includes all publicly funded or assisted schools and colleges (e.g. general, vocational and technical).

while only 16 per cent of those aged 20-24 are enrolled in a public institution of higher learning. In total, approximately 20 per cent of Malaysian in the age group 20-24 is enrolled in all institutions of higher education, domestic and abroad.

This shows that Malaysia's education system is successful only at providing mass education demonstrated through the high participation and high transition rates at the primary, lower and upper secondary levels. However, Malaysia has not been successful in developing human capital at the higher levels of education – more specifically from the pre – tertiary education level onwards.

Table 39 Participation rates by educational level, Malaysia, 1970-2010 (per cent)[a]

Educational level and age	1970 b	1980	1990	2000	2010
Primary (6 -11)	88.2	93.6	99.8	96.8	94.2
Lower secondary (12-14)	52.2	81.9	83.0	85.0	86.8
Upper secondary (15-16)	20.1	40.8	49.1	72.6	77.2
Pre-university (17-18) c	3.1	9.7	18.9	16.2	15.0
Tertiary (19 – 24)	0.6	1.8	2.9	8.1	16.0* (20**)

Note a – Refers to participation rates in public and government-aided institutions only (Enrolment/Population*100); b – Data refer to Peninsular Malaysia only; c – referred to as 'Post-secondary' in the source tables; * - author's calculation of domestic students in public universities; ** author's calculation of Malaysians from ages 20-24 enrolled for basic degree in domestic public and private universities and all Malaysian students enrolled overseas in 2010;

Source Hill et al. (2012) for data from 1970 to 2000; Ministry of Education (2011) and Ministry of Higher Education, Malaysia (2010) for all other data.

Malaysia's success in ensuring high rates of enrolment and participation at the lower and mid-levels of the education system is attributed mainly to supply side factors. These supply side factors are infrastructure such as schools, colleges, universities, teachers and administrators. Also, government policies to provide free education at the primary and secondary levels since the early 1960s and at the upper secondary level since the early 1980s has made education affordable for the majority of Malaysians. Major gains in transition from the different levels began in 1965 following the introduction of automatic promotion through nine years of schooling in 1964 and

through 11 years of schooling in 1988 (UNESCO 2011). In 2003, primary education was made compulsory with severe penalties to parents who fail to enrol their children in schools (UNESCO 2011).With education provided by the state, compulsory primary education and facilitated by automatic promotion, in 2010, the transition rate[61] from primary to secondary education was close to 86 per cent, and from lower to upper secondary education was about 96 per cent (Ministry of Education 2010).

However, transition from upper secondary to pre-university was 13.6 per cent in 2010. This drastic fall at the pre-university level has been a consistent trend since 1970. This raises the question on why despite the provision of 11 years universal education; there is serious attrition in secondary education. A longitudinal study by Nagaraj et al. (2006; 2008) discovered that of the 481,200 students who entered year 1 (beginning of primary) in 1993, only about three in four entered year 11 (end of upper secondary) in 2003 (Lee and Nagaraj 2006; Nagaraj et al. 2008). Malaysia now has a lower transition rate from upper to higher secondary school/pre university compared to countries such as China, Indonesia, the Philippines, Thailand or Vietnam (Cheong et al. 2010). Young Malaysians, it appears, prefer to opt out of education after completing their Sijil Pelajaran Malaysia (Malaysian Education Certificate/SPM)[62].

Participation rates at the tertiary level shows the highest increase overtime compared to all other age levels. This has been especially visible since 1990. Nevertheless, the outcome compared to the other East Asian economies, remains low at 16 per cent[63]. The main reason for this was the increase in the number of public and private universities that came with the liberalisation of the higher education sector in 1996.

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[61] The transition rate for primary to lower secondary is calculated by calculating the ratio of the enrolment rate at (Form 1/standard 6 * 100); enrolment into upper secondary (Form 4/Form 3*100) and into upper secondary/pre tertiary (Form 6 lower/Form 5 *100).

[62] The SPM is equivalent to O'Levels or the Australian Year 10 qualification.

[63] For comparative statistics, the World Bank Indicator 'School enrolment, tertiary (% gross)' is used. This indicator calculates gross enrolment as the ratio of total enrolment, regardless of age to the population of the age group that officially corresponds to the level of education shown. Here Japan in 2009 records 59 per cent gross enrolment at the tertiary level, Republic of Korea was 104% in 2009. Data for Singapore is not available while Taiwan is not a member of the United Nations. Malaysia was only 37% in 2008.

In 1990, there were six public universities which increased to 20 in 2007 while the number of private universities increased from one in 1999 to 37 in 2007[64], making it a total of 57 universities for a population of 28 million people (Ministry of Education 2010). This removed two critical bottlenecks in the flow of human capital and was relevant especially for non-Bumiputeras.

The first is that it made higher education more accessible by expanding the limited number of places available in public universities for non-Bumiputeras. The number of places available to non-Bumiputeras was severely curtailed with the introduction of the New Economic Policy (NEP). The NEP stipulated that 55 per cent of places in institutions of higher education were to be reserved for Bumiputeras (Ramesh and Asher 2000).[65] The second bottleneck addressed was that it improved access to Malaysians by making private tertiary education more affordable. Prior to 1990, non-Bumiputera students who were unable to get into public universities despite doing well in national examinations[66] were forced to go overseas. The costs of tertiary education overseas were significantly higher than in Malaysia's public universities. This acted as a significant deterrent to many non-Bumiputeras from pursuing higher education. However, the increase in the number of domestic universities has raised other challenges that are discussed shortly.[67]

The reasons that almost 75 per cent of students opt out of the education system after upper secondary are multifaceted. One important reason is the fact that there is no automatic transition from upper secondary to pre-university unlike at the other levels

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[64] This tabulation includes only recognised private universities, university colleges and branch campuses of foreign universities. There are several classifications of universities which are not included.

[65] The actual ratio is closer to 75 per cent (Ramesh and Asher 2000) as there are a high number of courses and institutions of higher learning which are exclusively for Bumiputeras. A confidential study commissioned by the World Bank identified that in 2008 almost 85 percent of places in public universities were filled by Bumiputeras (Mukherjee et al. 2011).

[66] The STPM (Sijil Tinggi Pelajaran Malaysia) is equivalent to the British Higher School Certificate or Australian Year 12 and used as the national test to gain admission into public universities. Due to affirmative action, a system of quota is used to determine absolute numbers from each race. Hence competition is limited to within racial groups and not across.

[67] The expansion of higher education institutions have created other problems such as a decline in the overall standards in higher education and poor quality graduates, decline in the premium of higher education qualification, and various social challenges stemming from high graduate unemployment.

such as at year six and year nine. The SPM, which is the national level examination at the end of 11 years of education, functions as a filter that determines placements in high schools, colleges' and other institutes of higher learning both domestic and international. Many students fail at the SPM level due mainly to lax standards being set on students prior to reaching the SPM level (Tan 2010). Also for many non-Muslims, the SPM is a significant barrier, as affirmative action ensures that only limited places in Malaysia's vast public institutions of higher learning are available to them. Many public institutions of higher learning are exclusively for Muslims either through overt legislations or through informal practises (Lee 2012).

It may also be the case that many students, in their adolescence, take this opportunity to exit the school system to work. The SPM is the basic qualification for entry into employment in Malaysia. Hence, many having completed SPM also exit the education system as they have the relevant qualification to get low-paid work in the services sector.

Many students also do not pursue further education as they are negatively influenced by the declining returns on investment for tertiary education (Nagaraj et al. 2009). The increased number of universities domestically and also the increased accessibility to foreign universities as a result of increased levels of income and the reforms in tertiary education globally has reduced the premium for tertiary education in Malaysia as the number of graduates increases exponentially.

The high unemployment rates among graduates have also influenced many students to exit the education system. Lucas and Verry (1999) found that unemployment was much higher among job seekers with post-secondary or tertiary education than those with an upper secondary education (the group that fills 80 per cent in the manufacturing sector). In 2001, unemployment among recent graduates (diploma and degree holders) was about 12.7 per cent (Baharuddin 2004), rising to 24.1 per cent in 2008 (Mohamed Khaled 2009). In 2007, graduates accounted for 25.1 per cent of the unemployed (Hill et al. 2012).

The lack of demand for the qualifications that graduates have attained, poor job search skills (Lim et al. 2008); poor choice of courses and lack of proficiency in English and soft skills (PICS 2005; 2009; Gill and Kharas 2007), easy access to university (Sjoholm 2005), and the increasingly more selective nature of the public sector in employing Bumiputera graduates (Jain et al. 2003) have been put forward as reasons for the high unemployment among graduates. .

Another indicator of failure of Malaysia's educational and training system is the poor educational outcomes at all educational levels. The quality of Malaysian students at all levels has come under severe criticism from various quarters (PICS 2005; PICS 2009; NEAC 2010; World Bank 2010a; World Bank 2010b). Criticism has also been extended to the quality of teachers and academics throughout the educational system.

While quality of education is difficult to assess precisely, there are three internationally acknowledged cross –country assessments that can be used to rank educational outcomes. They are the Trends in International Mathematics and Science (TIMSS), the Progress in International Reading Literacy Study (PIRLS) and the Programme for International Student Assessment (PISA). Malaysia did not participate in the PIRLS study and only started participating in the PISA study since 2010 in which Malaysia performed significantly below OECD average levels (World Bank 2012).

Malaysia's score on the four TIMSS benchmark for mathematics and science fell between 1999 and 2007 (Mullis et al. 2008) although there was a slight improvement from 1999 to 2003. Furthermore, in the TIMSS 2007, approximately 20 per cent of Malaysian students failed to meet minimum benchmarks for both Science and Mathematics, compared to only 5 per cent in Science and 7 per cent in Mathematics in 2003 (World Bank 2012). Malaysian students' performance in TIMSS 1999 – 2007, was significantly weaker than their counterparts from Japan, Korea, Taiwan and Singapore (Mukherjee and Wong 2011).

A study by Altinok and Murseli (2007) that developed a method to develop qualitative indicators of human capital for approximately 105 countries reaffirms the

findings that Malaysia's human capital development is not on par with the benchmark countries. The study developed four quantitative indicators based on the various studies that measured the performance of school-going children in mathematics, science, reading and a general index. Malaysia lags the benchmark countries in all aspects as reported in Table 40.

Table 40 Qualitative indicators of human capital for selected countries

Country	QIHC-M	QIHC-S	QIHC-L	QIHC-G
Japan	92.20	96.62	91.71	93.51
Korea	94.45	96.24	98.35	96.34
Taiwan	96.9	98.7	..	97.4
Singapore	100	100	90.14	96.71
Malaysia	83.97	88.24	..	86.11

Note QIHC-M 'Qualitative Indicators of Human Capital in Mathematics', QIHC-S 'Qualitative Indicators of Human Capital in Science', QIHC-R 'Qualitative Indicators of Human Capital in Reading', QIHC-G 'General Index of Qualitative Indicators of Human Capital'

Source Altinok and Murseli, (2007).

Malaysia's tertiary education system is also not highly regarded. The disparity is self-evident when Malaysia's premier university, the University of Malaya (UM) is compared to her sister university, the National University of Singapore (NUS). Between 2004 and 2009, The Times Higher Education – QS World University Rankings (THE-QS 2008-2011) showed NUS among the world's top 20 (2004, 2005 and 2006) and top 30 (2008 to 2011), with UM moving progressively lower between 2004 and 2011 from 89 to 167, reaching an all-time low of 230 in 2008, before improving to 180 in 2009 and then dropping again to 207 in 2010. No other Malaysian university is ranked in the top 200 universities globally.

These issues have contributed to the limited stock of skilled human capital in the economy. This contributes directly to the critical shortage of skilled labour in the manufacturing sector. The government's sustained investment nevertheless has shown some results. The mean level of education in the labour force has increased. The proportion of the labour force with no formal education declined from 14.1 per cent in 1970 to 9.0 per cent in 2010, while those with upper secondary education has risen to 37 per cent. In contrast, those with pre-university (high school and diploma) and tertiary have reached 21.4 per cent of the total labour force, demonstrating strong gains from government investment in human capital. Nevertheless, those with tertiary level qualification remain at a low of 10 per cent despite the expansion in tertiary education more than 20 years ago.

Table 41 Educational attainment of the labour force by educational level, Malaysia, 1985 – 2010 (per cent)

Educational level	1985	1990	1995	2000	2005	2010
Not applicable	13.9	9.8	8.7	5.6	4.6	3.6
No certificate	55.8	53.6	40.6	37.5	29.4	9.0
UPSR – primary	..	..	..	..	..	12.3
PMR/SRP/LCE/SRA – lower secondary	9.4	8.5	14.0	13.3	14.1	14.0
SPM – upper secondary	14.6	20.2	25.7	29.6	33.3	37.3
STPM – High school	1.3	2.2	3.5	3.1	2.9	3.2
Diploma	2.7	3.2	4.0	5.8	8.4	8.2
Degree	2.1	2.5	3.4	5.1	7.3	10.0
Total	99.8	100	99.9	100	100	97.6

Source Department of Statistics, Labour Force Survey Report, various years

The composition of the labour force has also changed to reflect the improvements in basic educational attainment. Those with lower levels of skills still dominate the labour force. The proportion of workers in all occupational categories except agriculture has increased. The share of professional, technical, administrative and managerial workers increased from 5.5 per cent of the workforce in 1970 to 15.2 per cent in 2000 while the agricultural workforce declined from 53.6 per cent to 18.1 per cent. One third of the workers were classified as production workers in 2000.

Table 42 Employment by occupational groups, Malaysia, 1970-2000 (per cent)

Occupational groups	1970	1980	1990	2000
Professional, technical and related workers	4.8	6.0	8.8	11.0
Administrative and managerial workers	0.7	1.0	2.4	4.2
Clerical and related workers	5.0	7.3	9.8	11.1
Sales workers	8.3	9.8	11.5	11.0
Service workers	8.2	8.7	11.6	11.8
Agricultural, animal husbandry and forestry workers, fishermen and hunters	53.6	38.7	28.3	18.1
Production and related workers, transport equipment operators and labourers	19.4	28.5	27.6	32.8
Total employed ('000)	2794.0	4816.9	6621.0	9271.2

Note Occupation classified according to the 'Dictionary of Occupational Classification, 1980'

Source Department of Statistics, (2011).

Using a more detailed occupational classification standard introduced in 1998 as set-out in Table 42, 21 per cent of the total labour force in Malaysia can be categorised as skilled workers (Level 2 and 3), and 11 per cent as unskilled (elementary occupations). The bulk of workers in Malaysia, 68.2 per cent, are semi-skilled (Level 4 to 8) reflecting the structure of a country that is industrialising but with an inadequate human capital base to transition to a developed economy.

Table 43 Employment by occupational groups, Malaysia, 2001-2010 (per cent)

Skill level and occupational groups	2001	2005	2010
1. Legislators, senior officials and managers	7.4	7.7	7.5
2. Professionals	4.9	5.5	6.3
3. Technicians and associate professionals	12.0	12.6	14.8
4. Clerical workers	9.5	9.9	10.2
5. Service workers , shop and market sales workers	13.8	14.8	16.8
6. Skilled agricultural and fishery workers	13.5	12.6	11.3
7. Craft and related trade workers	12.4	11.4	10.5
8. Plant and machine operators and assemblers	15.8	14.2	11.8
Elementary occupations	10.6	11.2	10.7
Total employed ('000)	9357.0	10045.4	11129.4

Note Occupation classified according to the 'Malaysia Standard Classification of Occupations (MASCO), 1998'. Level 2 and 3 are classified as skilled workers, levels 4 to 8 are semi-skilled workers, and elementary occupations as unskilled workers.

Source Department of Statistics, (2011).

The structure of the workforce in the manufacturing sector is quite similar to the national structure where the bulk of the workers are classified as semi-skilled or unskilled. This is the key challenge faced by Malaysia with regards to human capital development. Although the structure of the workforce has changed as predicted by various economic theories since industrialisation became a central strategy in the Malaysian manufacturing sector more 40 years ago, it remains low skilled. While in the early 1970s and 1980s, it was mainly unskilled workers in labour intensive industries, it is now mostly semi-skilled workers but still in labour intensive although more sophisticated manufacturing industries as reported in Table 43 (Lall 1999; Rodrik 2006; Athukorala et al. 2009).

Table 44 Skills structure in the manufacturing sector (per cent)

Skills structure	2000		2005	
	Domestic	Foreign	Domestic	Foreign
Total labour (in numbers)	1574797		1675163	
Total labour by citizenship (in %)	86.1	13.9	78.1	21.9
Skilled workers (total)	16.5		18.6	
Skilled workers	16	0.5	18	0.6
Managerial and professional	5.1	0.3	6.9	0.3
Technical and Supervisory	10.9	0.2	11.1	0.3
Semi-skilled workers (total)	78		74.44	
Semi-skilled workers	64.7	13.3	53.8	20.64
Clerical and related occupation	6.2	0.03	6.4	0.04
Production/operation workers	58.5	13.1	47.4	20.6
Unskilled labour (total)	3.5		4.3	
Unskilled workers	3.3	0.2	3.9	0.5
General workers	3.3	0.2	3.9	0.5

Source Department of Statistics, (2011).

When using educational attainment as an indicator of structural change in the manufacturing sector, it becomes evident why there is continued reliance on unskilled and semi-skilled labour in Malaysia's manufacturing sector. Table 44 provides a clear indication of this. The number of Malaysians with tertiary level qualifications in the manufacturing sector has increased marginally from 4 to 7 per cent, while those with diplomas has also only increased marginally from 9 to 12 per cent over the past nine years. This is despite the fact that the manufacturing sector has taken root in Malaysia for over 40 years. The majority of domestic workers in the manufacturing sector – almost 82 per cent – have no more than upper secondary school qualifications.

Table 45 Educational attainment of manufacturing sector domestic labour force (per cent)

Educational level	2000	2005	2009
University degree and above	4	7	7
Diploma/STPM[68] or equivalent	9	12	12
SPM/SPVM[69] or equivalent and below – upper secondary	87	84	82

Source Department of Statistics, (2011).

The poor educational outcomes, high graduate unemployment, especially among Bumiputera graduates, the significantly large group of unskilled and semi-skilled labour – 80 per cent – and shortage of skilled labour point to systemic failure. The relevant institutions that produce human capital and that coordinate the supply and demand of labour between the educational institutions and the manufacturing sector has failed to perform its functions effectively. The institutional reasons for this failure relate mainly to ideological reasons and the lack of autonomy in the organisations that deliver education and training, which are discussed below.

INSTITUTIONS – IDEOLOGY AND LANGUAGE POLICY

The decision to use Bahasa Malaysia in the public sector and therefore in the education system is a direct outcome of the ideology of Malaysia's ruling party of developing a national identity around the Malay language and Malay/Islamic culture (Rajandran 2008; Brown 2007). As part of the bargain agreed at independence among the political ethnic elites, was the guarantee that the Malay, Tamil and Chinese vernacular systems were allowed to continue. English, a key medium of education and instruction was discontinued in 1961. A significant component of educational reform in Malaysia since then has been to centralise education around the Malay stream with

[68] STPM – Sijil Tinggi Pelajaran Malaysia or Higher School Certificate (HSE) or Year 12.

[69] SPM/SPVM – Sijil Pelajaran Malaysia (SPM) and previously known as the Malaysian Certificate of Education (MCE). It is equivalent to the British O'Levels or the Australian Year 10. The SPVM is the Sijil Pelajaran Vokasional Malaysia or the Malaysian Vocational Education Certificate.

Malay as the language of instruction in the national schools system. By 1983, Malay had become the sole medium of instruction in the national education system.

In 2002, the Malaysian government, without prior consultation, made English, the language of instruction for the teaching of Mathematics and Science and Technology subjects. This was to be implemented in stages beginning from 2003 with the aim of making English the medium of instruction for these two subjects at all levels by 2008. This decision was based on the rationale that mastery of English is regarded as an important mechanism for direct acquisition of knowledge in the field of science and technology (Ong and Tan 2008).

This led to many problems. There were critical human capital constraints as the public education sector was populated by teachers with weak English language capability and other challenges such as inadequate teaching resources for these subjects in English (Ong and Tan 2008). Furthermore, the majority of Malaysian students, their parents and contemporaries were educated in Malay and their English proficiency was weak.[70] This made understanding abstract concepts in mathematics and science even more challenging. After sustained protests from various groups', especially Malay and other vernacular language advocates, the policy was reversed in 2012 with the option for students who wanted to continue studying Mathematics and Science in English to continue.

The emphasis on Malay language and the decline in the overall quality of education in the national schools system has had an unintended impact on human capital development and technological upgrading. Language and an industrialisation strategy that is based on technological progress are intimately linked (Ritchie 2005). Technological progress depends on the ability of a country to absorb, disseminate technology and ultimately innovate. When technologies exist in the local language,

[70] Tan and Raman (2007) in the paper, 'Problems and challenges of learning through a second language: the case of teaching of science and mathematics in English in the Malaysian primary schools' Kajian Malaysia, Jld XXV, No. 2, pp. 29 – 54, noted that in 1994, 45.5 percent of students failed English in the national level examination at year 6, 41.8 percent failed English at the national exam at year 9, and 38 percent failed English at the Year 11 national examinations.

combined with knowledge of the basic science of the technology, the technology can be dispersed widely, comprehended, utilised and improved. If the knowledge of the technology exists in a foreign language then one of the two must be done - either the knowledge must be translated or the society must be fluent in the foreign language.

Malaysia's preferred mode for technology transfer is either by acquiring it from foreign multinationals or through foreign direct investment.[71] However Malaysian firms in the manufacturing sector (specifically in the electrical and electronics industry) have not developed effective linkages with the MNCs (Kline et al. 2011; Yusof and Nabeshima 2009). More importantly, Malaysia has not successfully developed institutions to extract, centralise, organise, translate and disseminate the required technology compared to Korea, Taiwan and Japan (Johnson 1987; Amsden 1990; Wade 1990). Without these institutions, the ability to bridge the technological gap between foreign and local firms is limited.

Persistent mismatches between language and technology access hinder the transmission and absorption of technology in three ways. First, the technology is available only to a select few in the firm that can speak the foreign language (e.g. English, French, German, Japanese, et cetera). Second, the technology resides almost exclusively in the foreign company. Third, it is difficult to link the foreign firm to the education and training infrastructure, including the components of the institutional system responsible for research and development. Malaysia's insistence on the Malay language as the language of instruction compounded by the inconsistency in its language policy, and the decline in the quality of education had hampered human capital development and technological upgrading (Ritchie 2005).

[71] This is discussed in detail in the next section – Institutions, the production of tacit knowledge and human capital development.

INSTITUTIONAL SECTORS – EDUCATIONAL SYSTEM

Quality education requires accountability and autonomy for individual schools and institutions of higher education. Both of these characteristics are in short supply in the Malaysian educational system. Accountability requires frequent and rigorous assessments of the quality of education. Despite numerous education reforms undertaken by the government, Malaysia's educational outcomes remain on a long term downward trajectory (Ong 2010).

In the 23 country OECD's 'Teaching and Learning International Survey' (TALIS), Malaysia ranked poorly in terms of delegation of authority to schools as set-out in Table 46. It was placed last in six of the 13 categories and its performance was significantly lower than the 23 country TALIS average.

Table 46 School autonomy at lower secondary – TALIS 23-country study

	Malaysia	Korea	23 Country TALIS Average	Malaysia Rank [a]
1. Selecting teachers	6.9	31.2	67.7	23
2. Firing teachers	6.8	20.8	60.7	23
3. Establish Teacher Salaries	4.0	5.7	24.3	18
4. Determine Salary Increases	11.4	3.7	25.6	15
5. Professional Development	33.8	63.2	60.3	17
6. Formulate School Budget	68.8	77.3	75.3	17
7. Allocations Within Budget	62.5	94.9	88.2	21
8. Discipline Policies	56.7	56.7	93.1	23
9. Assessment Policies	21.6	91.1	88.9	23
10. Admission Policies	21.6	85.8	85.0	23
11. Course Offering	35.4	88.7	72.2	22
12. Course Content	33.4	85.4	65.7	20
13. Choosing Textbook	19.0	96.7	90.0	23
Average	29.4	61.6	69	20.6

Note a – 1 = top and 23 = bottom

Source World Bank, (2012).

Malaysia has a highly centralised education system with four hierarchical levels at the federal, state, district and schools. All major decisions are taken at the federal level at the Ministry of Education and the relevant department, the Curriculum

Development Centre, the school division and the Malaysian Examination Syndicate with the Education Minister and his Cabinet colleagues always being the ultimate decision makers.[72]

Universities in Malaysia also have limited autonomy in decision making. Sirat (2009) identified six dimensions to analyse the relationship between the state and Malaysia's universities. They are (i) financial relations; (ii) administrative relations; (iii) knowledge and information flow; (iv) human resources flow; (v) the conferral of status; and (vi) ideology. Sirat (2009) concludes based on the six relationships noted, that State-centrism still dominates and that universities in Malaysia have little autonomy. The autonomy that they have are driven more by the increasing complexity of knowledge generation and the liberalisation of higher education globally. This state – centrism is one of the main reasons for the poor showing of Malaysia's universities.

In a recent assessment comparing Malaysia's premiere university – the University of Malaya (UM) – with the National University of Singapore (NUS), Singapore's top university, Mukherjee and Wong (2011) identified several salient points that explained UM's mediocre performance which can be generalised to the tertiary education sector. They note that UM's mediocre performance is a direct outcome of Malaysia's affirmative action policy. UM institutional goals reflect the demands of the New Economic Policy (NEP) namely the imposition of ethnic quotas for student admission. These findings also supported another important study by Lee (2012) which demonstrated that affirmative action had diluted the quality of education. These findings can be generalised to all public universities in Malaysia.

Apart from the student quota system, the NEP also translated into more scholarships to Bumiputera students to universities, a special foundation and matriculation programs to facilitate their entry into higher education institutions, the use of the Malay language in place of English in the entire education institutions including

[72] Technically the Parliament is all powerful as it approves all legislations, but in a country which is classified as an electoral authoritarianism, the real power is with the ruling party (MacIntyre, 2001).

universities by 1983, special pre university schools and colleges for rural Bumiputera children, and greater opportunities provided to Bumiputera students to study science at the tertiary level. In the public universities as it was in government, the NEP impact spiralled upward so that Bumiputera staff members, over time, secured almost all senior management, administrative and academic positions and also in the Ministry of Education. Ethnicity and not merit was the overriding criterion for placement and employment in universities. The state – centrism also made these universities unaccountable to the public as they were beholden to the political objectives of the state.

INSTITUTIONS, THE PRODUCTION OF TACIT AND IMPLICIT KNOWLEDGE AND HUMAN CAPITAL DEVELOPMENT

The second explanation for low human capital development in the manufacturing sector is the weakness in generating tacit and implicit knowledge at the firm level. Entrepreneurs and labour acquire and develop tacit and implicit knowledge and skills by performing in real business environments and in an integrated cluster network rather than simply in a vacuum or in formal training institutions (Rasiah 2001). The challenge has been to develop the institutions that will facilitate this aspect of human capital development.

At the macro level, Malaysia's indicators on the production of tacit and implicit knowledge which is proxied through indicators such as high technology exports, research and development spending, researchers per capita, technicians per capita, number of patent applications, scientific and technical journal articles are not encouraging when compared to the successful East Asian counterparts. Malaysia lags significantly behind in these indicators.

Table 47 Selected comparative indicators of the production of tacit and implicit knowledge, 2010

	High Technology Exports 1	R&D (% of GDP)	Researchers in R&D per capita	Technicians in R&D per capita	Scientific & technical journal articles
Japan	18	3.54**	5189.3	597.1	49627
Korea	29*	3.36**	4946.9**	824.8	22271
Taiwan	..	..	..	..	..
Singapore	50	2.1**	5834.0	596.8	4187
Malaysia	45	0.6#	364.6	43.0	1351

Note 1 – High technology exports (HTE) are products with high R&D intensity. HTE is measured as a percentage of manufactured exports; * 2009; ** 2008, #2006

Source World Bank Data Indicators, (2012).

Malaysia's location as the assembly of high technology electrical and electronics exports masks the lag in developing skilled human capital in the manufacturing sector. An important reason for this is the weak linkages, both among the private sector but also between the public and private sector in the manufacturing sector.

As Malaysia reached its turning point with surplus labour in the late 1980s, the focus of industrial policy and the attendant institutions shifted towards industrial deepening as the government attempted to take advantage of low unemployment levels. To overcome issues related to collective action, coordination and free riding, the government created several institutions ranging from legislations, master plans and policies to organisation, to overcome anticipated market failures.

The Action Plan for Industrial Technology Development (APITD) of 1990 helped provide the groundwork for the establishment of several of these institutions such as the Human Resource Development Fund (HRDF) in 1992, Malaysian Technology Development Corporation (MTDC) and the Malaysian Industry Government High Technology (MIGHT) in 1993, and the cluster based Second Industrial Master Plan (IMPII) in 1996 set the blueprints for this transformation. This was followed by the Multimedia Super Corridor (MSC) and the opening of the Multimedia Development Corporation (MDC) in 1997. Nevertheless, none of these

institutions have been successful in promoting high human capital formation in the private sector. The East Asian Financial Crisis put paid to many of these ideas and institutions.

The most pertinent example to demonstrate the failure of private sector linkages in developing human capital with the tacit and implicit knowledge in the manufacturing sector is the electrical and electronics (E&E) industry. The E&E industry is a key driver in the Malaysian economy. In 2008, it contributed 42 per cent of Malaysia's total exports and was by far the largest contributor, although this was a significant decline from 62 per cent in 2000. It is also the single largest contributor to the manufacturing sector output (more than 33 per cent) and employs 5 per cent of Malaysia's total workforce.

The industry is dominated by multinational corporations (MNCs) and the role of local manufacturing firms has largely been confined to being vendors, suppliers or outsourcing partners. Despite the E&E industry having been in Malaysia for more than 40 years, there is no internationally acclaimed Malaysian company, let alone a Malaysian developed product or process, in this field. While the industry has continuously provided impressive economic statistics for Malaysia, it has an average value add of just 8.4 per cent of gross exports confirming the limited linkage it has with the domestic economy.

There are an extensive number of in-depth studies that have clearly demonstrated the weak linkages between the private and public sector and in the private sector especially to link small and medium scale enterprises with MNCs. Examples of these linkages were the setting up of skills centres such as the Penang Skills Development Centre (PSDC), the Selangor Human Resources Development Centre (SHRDC) and the Johor Skills Development Centre (JSDC). Only the PSDC was a success as it attracted strong participation by both local and foreign firms. SHRDC and JSDC were failures as they lacked the inter-firm and firm – institution relation needed for strong participation (World Bank 2006).

Rasiah (2002; 2005) through extensive firm level surveys demonstrates weak linkages between the public education, research and development organisations, chambers of commerce and industry and the firms.

One important reason for this weak linkage is the basic approach that the public sector has towards the private sector. Public-private sector linkages in Malaysia functions in formally soliciting the input of the private sector for policymaking processes, which was an outcome of the Malaysia Inc. (Malaysia Inc. (Incorporated)) idea that was proposed by Malaysia's third prime minister. Both the Malaysian Business Council (MBC) and the Malaysian Industry-Government Group for High Technology (MIGHT) were created to coordinate government initiatives with the needs of private firms.

In 1999, at the height of the East Asian economic crisis, of the 84 members of MIGHT, businesses made up 79 per cent (66 members), with approximately 11 per cent (9 members) foreign. Nevertheless, among the influential permanent members only one (5.5 %) represented business, with the rest representing academia, public research institutes, and the government (MIGHT 1999). Presently, there are 58 ordinary members, 32 permanent member and two associate members. The lead members are Malaysia's three largest government linked corporations. All permanent members are government bodies while the ordinary members are dominated by government linked corporations, state owned companies or businesses that have benefited from close association with the government (MIGHT 2012).[73]

Although more formalised, these bodies operate much like the high-level government committees but in ineffective for several reasons. First, neither includes labour. Second, they do not engage in direct policymaking themselves, but act as consultative bodies to the ministries, agencies, and departments that do. Finally, MIGHT is actually a wholly owned government corporation and therefore does not

[73] The website link provides the names of the members of MIGHT.

engage directly in policymaking. Instead, it must funnel input from its members to internally insulated policymaking bodies.

Even at the line ministry level, Malaysia's public sector has been unable to develop the linkages with the private sector. In most cases, where committees exist to promote human capital development or technology policy, they are most often populated by the department's own people with a token number of representatives from the private sector (Ritchie, 2001; 2004; 2008).

The Multimedia Development Corporation (MDC) has been touted by the government as a new model of public-private cooperation. It does indicate that Malaysia is making a concerted effort to formalise the linkages between the public and private sector. For example, Malaysia has solicited the input and advice from numerous foreign and local technology firms in a Technology Advisory Panel. High-ranking executives, often the CEO, MD, or President, offer input, advice, and direction to the Multimedia Development Corporation, the group responsible for the development of the MSC. However none of these people are actually involved in the policymaking process. Indeed, neither are the officials at the MDC, another wholly owned government corporation under the prime minister's office. Instead, input from the advisory panel is funnelled through the MDC to the office of the prime minister where actual policymaking takes place.

Since the financial crisis of 1997/98, most of these institutions targeted towards human capital development and technological upgrading have taken a back seat as the country moved away from the manufacturing sector towards the services sector. Nevertheless, the basic problem of human capital development in the manufacturing sector remains.

The issue of limited integration or linkages into the domestic economy either to other private sector firms or public sector institutions, is due mainly to the focus of domestic institutions on other priority issues such as wealth distribution, employment

generation or the demands of the entrepreneurs rather than on creating and building a technology platform.

INSTITUTIONAL SYSTEMS – LIFELONG LEARNING AND TRAINING

An important reason that has led to the skills mismatch in the manufacturing sector is the limited private sector involvement in the process of developing and implementing technical and vocation training programmes (World Bank 2012; Ritchie 2005; Rasiah 2005)

A recent assessment of the Malaysian National Dual Training System (NDTS) has yielded some insights into why skill training programmes remain mismatched with industry in Malaysia (Pang 2010). The NDTS was modelled after the successful German vocational training system. However, the study found that the two systems are different in one critical respect – the role played by the private sector in shaping the programme. In the Malaysian system, unlike the German one, the Government plays the lead role in developing, funding, implementing, and overseeing the system, while the private sector plays a supportive role. In terms of coordination and quality control, the Malaysian system is centralised, mostly through the Economic Planning Unit (EPU) and the Department of Skills Development, with no role for employers and workers organisations (World Bank 2012).

Another reason for the skills mismatch is the low take-up rate for vocational and technical training. A recent study by the government (EPU 2009) attributed the low and declining take-up rates partly to the fragmentation of the training system which overwhelms students and parents as they lack the necessary information in order to make informed decisions among the plethora of available options. The study also pointed out that the quality of the training offered varies significantly, which leads industry to distrust the qualifications produced by the vocational training sector. Another study found that complicated financial schemes available for technical and vocational training have also led to low take-up rates by students.

The failure of the government to engage the manufacturing firms effectively in developing private and public sector linkages especially in training, retraining and up-skilling, and in policymaking has contributed to the failure in human capital development.

LABOUR MARKETS AND HUMAN CAPITAL DEVELOPMENT

The third reason for the manufacturing sector's reliance on low skilled labour is government policies that impact on Malaysia's labour market institutions. As early as 1991, in a study commissioned by the Government of Malaysia, the World Bank had recognised that the Malaysian labour market was tightening and recommended a restructuring of the labour force towards higher skilled labour (World Bank 1991). The problem worsened by the mid-1990s as Malaysia experienced critical labour shortages in all skills categories (Jomo and Felker 1999) on the back of a booming economy. Despite government attempts towards industrial deepening to address tightening labour markets through various measures including labour market reforms, the economic facts suggest that these have been failures. The focus is on two key inter-related aspects of labour market institutions to explain this failure. They are the national level industrial relations (IR) and the corresponding firm level human resources policies, and immigration policies affecting migrant labour in the manufacturing sector.

Malaysia has a strong state and employer dominated IR model (Kuruvilla and Erickson 2002). It is characterised by extensive state control guaranteeing a high level of managerial prerogative within the workplace, minimal overt conflict and very little bargaining power for labour (Arudsothy and Littler 1993; Jomo and Todd 1994; Ariffin 1997; Todd and Peetz 2001). Within this framework, the Malaysian government has pursued four dominant industrial relations/human resources (IR/HR) strategies to shape its industrialisation efforts and technological upgrading (Kuruvilla 1996a) as illustrated in Figure 19.

Figure 19 Industrialisation strategies and national industrial relations/human resource policy goals framework

	Import Substitution Industrialisation	Export Oriented Industrialisation
Primary	IR/HR Policy Goal = Stability Passive HR practises Paternalistic IR practises Pluralistic system Relatively Tayloristic work organisation	IR/HR Policy Goal = Cost Containment Cost containment oriented HR practices Union avoidance and suppressive IR practices
Secondary	IR/HR Policy Goals = Stability + Productivity Enhancement active HR practices to increase productivity collaborative IR practices pluralistic system	IR/HR Policy Goals = Workplace Flexibility, Productivity, Skills Development Aggressive HR practices promoting skills and flexible pay dynamic work organisation positive and non-union HR practises highly flexible HR systems

Source Kuruvilla, (1996a).

These four dominant IR/HR strategies are determined by two key factors. The first factor is the type of industrialisation strategy that is promoted by the state. There are essentially two types of industrialisation strategy; import substitution industrialisation (ISI) strategy or export oriented industrialisation (EOI) strategy. The second key factor is finding the balance between stability and human capital development. These two factors are used to calibrate other issues that impact on Malaysia's industrialisation strategies.

ISI industries receive government protection and often the workers in these industries constitute an important stakeholder for the government. Therefore, under a primary ISI strategy and the lack of significant external competition allows the government to pursue more comprehensive IR/HR policy goals while its secondary priority is to achieve both stability and productivity enhancements.

A primary EOI strategy based on cheap labour and foreign direct investment requires a cheap labour force with the appropriate levels of productivity and skills, a labour movement whose structure and policies do not deter foreign investment through labour militancy or resistance to the introduction of new technology and dispute resolution mechanisms that can quickly solve industrial conflict. The transition to secondary EOI requires IR/HR policies that emphasise productivity, increased skills formation, and workplace flexibility.[74]

Malaysia has undertaken both strategies ISI and EOI. The ISI had three distinct periods namely, 1957-1963 which was private sector led, and from 1963 – 1970 and 1981 – 1985, which were driven by the state. The EOI phases were from 1970 to 1980, and which was further strengthened after 1985. However, industrial relations policies have remained constant.

The focus of the Malaysian government was primarily to contain conflict and cost in the interest of economic development (Kuruvilla and Arudsothy 1995; Jomo and Todd 1994, Hill et al. 2012). The prohibition of strikes and restrictions on the ability of the various national labour federations to carry out trade union functions ensured that the government had control over the labour movement.

At the level of the firm, legislation was also restrictive with restrictions on the subjects of bargaining (transfers, promotions, layoffs, retrenchments and job assignment were deemed to be outside the scope of bargaining) and restrictions on the ability of unions to strike. Wage bargaining was largely at the industry level (Kuruvilla and Arudsothy 1995; Kuruvilla 1996a and 1996b).

The emphasis on cost containment in the manufacturing sector can be seen in the government's refusal to enact minimum wage legislation for the export industry (or for that matter any industry), its refusal to enact equal pay for equal work in the export oriented sector where 78.6 per cent of those employed were female (Rasiah 1994), and

[74] Workplace flexibility here is defined as the ability of employers to quickly react to changes in market demands by restructuring work organisation, compensation, human resources practices and labour relations.

the liberal policies in allowing in migrant workers but refusing them to become unionised.

The second critical point is the institutions that regulate the use of migrant workers in the manufacturing sector in Malaysia. As the Malaysian economy reached full employment towards the late 1980s and early 1990s, the government's efforts at industrial deepening were not effective and firms approached the government to import unskilled foreign labour to sustain their operations (Devadason and Chan 2009). This option further reduced the pressure to upgrade technology (Rasiah 2011). The government's focus on unskilled labour in the 1980s and 1990s essentially undermined firm-level initiatives to upgrade as they continued to absorb unskilled domestic and foreign labour.

Table 48 Malaysia – Distribution of foreign workers by key sectors (per cent)

Sector	1985	1990	2000	2005	2008
Agriculture 1	50.1	37.7	24.8	26.0	25.0
Manufacturing	6.9	8.8	38.1	32.1	36.0
Construction	15.0	34.4	8.5	15.5	14.0
Non-domestics services	20.3 2	19.1	6.7	8.8	9.0
Domestic services	...	...	22.0	17.6	16.0
Total (%)	95.3	99.5	100.0	100.0	100.0
Total ('000)	212	440	807	1815	2020

Note 1 Includes forestry, fishing and mining; 2 – Includes domestic services; ... – Not available

Source Athukorala and Devadason, (2011).

The majority of foreign workers in Malaysia are semi-skilled and unskilled as reported in Table 43. Foreign workers cannot benefit in any way from the human resources development funds that are available to Malaysians. Employers are reluctant to invest in training for migrant workers mainly because immigration policies limit the duration that foreign workers can work in Malaysia to five years. The unlimited supply of migrant workers and the non- existence of trade unions or minimum wage policies, and lax enforcement of immigration laws, provide employers with a continuous supply of cheap migrant labour.

Policies that allow unskilled and semi-skilled labour to work in Malaysia are more liberal than the policies for expatriates which cover skilled workers – the very type of labour that Malaysia needs. As with most policies when the economic interest of the state or its coalition is threatened, exceptions are made. The Multimedia Super Corridor (MSC) is a good example. In this case, firms with MSC status can import as many foreign skilled workers as they need. Firms without MSC status are restrained by Malaysian labour laws from bringing in foreign skilled workers. This is ironic as the largest manufacturing firms are not MSC status companies such as the electronic and electrical multinational (e.g. Intel, Fujitsu and Sony) which have establishments throughout the country but are unable to freely bring in skilled foreign workers.

Initiatives to attract local born emigrant talent to meet the demand for skilled workers have also been a failure mainly because of their bad design. For example, the government initiated a 'Come Home', 'Brain Gain' and the most recent setting up of TalentCorp. None of these policies have thus far delivered results (World Bank 2011). The benefits that these policies provided did not address the underlying reasons that led to these local born talents emigrating.

CONCLUSION

This chapter argued that there are three institutional reasons to explain the manufacturing sector's reliance on low skilled labour and rising income inequality. The first is the failure of educational and training institutions to produce the required quantity and quality of skilled labour. The second is the failures of firms in the manufacturing sector to train, retrain and/or up-skill its workers. The third reason is attributed to government policies that undermine efforts by firms and individuals to invest in human capital development. Stated differently, Malaysia's institutions such as its education system, public – private and public-public sector linkages and labour market policies have been targeted towards a low cost export oriented industrialisation

strategy, meeting the expectations of Bumiputera interests, and the firms in the manufacturing sector responded to these incentives.

The government's attempts to develop human capital through technological deepening and industrial upgrading, using education and training system and industrial policies has failed to take – off for various economic and political reasons. The democratisation of public education from the primary to secondary school level has had the effect of increasing participation rates in schooling. However the educational outcome of the increased student participation has not been encouraging. Furthermore, the democratisation at the tertiary level for the Bumiputera community has had the unintended effect of diluting the overall quality of tertiary education in Malaysia.

The increased supply of low and semi-skilled labour due to the democratisation of education has led to shortages and mismatches in the labour market. Weak public-private sector linkages and private sector linkages among firms and limited investment in training within the manufacturing sector have led to poor outcomes in the production of labour with tacit and implicit knowledge. This has undermined further the efforts in human capital formation.

Coercive industrial relations policies have also suppressed wages and undermined the successful strategy used by successful East Asian economies of a tripartite strategy of state-capital-labour working collaboratively in human capital development and industrial upgrading. This has been exacerbated by a major policy error in response from private sector demand to overcome labour shortages – the liberalisation of Malaysia's labour markets towards unskilled and semi-skilled foreign workers.

Hence, the failure of the current institutional architecture is due mainly to the failure of Malaysia's educational and training institutions, the public-private sector networks and labour markets. The significant contribution of low skilled labour towards manufacturing output and the increasing income inequality between skilled and unskilled labour, as well as the general decline in the quality of human capital and the

current organisations responsible for their development, the weak research and development capabilities in the public and private sector, and the failure of institutions that coordinate the demand and supply of human capital are simply the manifestations of these perverse economic incentives.

In order for Malaysia to overcome the middle-income trap, these institutions will need to be reformed. This is discussed in the concluding chapter.

Chapter 8 Conclusion

> Even if our bodies are crushed and our lives lost, brothers and sisters, whatever happens, we must defend Putrajaya.
>
> Prime Minister Najib Razak, (2012).

Malaysia is among an important group of countries whose growth performance has nearly stalled, after a period of progress towards higher income levels. Its inability to overcome the middle-income trap is linked inextricably to the quality of its institutions. This chapter concludes the argument by revisiting the research questions, the research methods, the key theoretical concepts used, the key findings and the conclusions of the thesis. It goes on to make a number of recommendations to address the key institutional weaknesses in developing human capital that exist in Malaysia. The chapter highlights the contribution of the thesis towards understanding the importance of the role of institutions in human capital development and addressing income inequality in Malaysia's efforts to overcome the middle-income trap.

Introduction

Chapter 1 established through a literature review that Malaysia was in a middle-income trap. More importantly, in 2010, the Government of Malaysia accepted a report by the National Economic Action Council (NEAC) which identified that Malaysia was caught in a middle-income trap; a situation where the Malaysian economy is caught between countries with low wage producers and highly skilled innovators and not being able to compete with either. The report highlighted Malaysia's declining rates of growth for gross domestic product (GDP), exports, gross capital formation, private investment including foreign direct investment (FDI), and total factor productivity (NEAC, 2010a) as evidence of being in this trap. The report attributed Malaysia's declining economic performance to domestic factors such as capability constraints, productivity ceilings,

institutional degradation; and external constraints such as weak foreign investor confidence, sluggish global economy, and the economic ascendancy of low cost regional competitors. The report went on to propose that if the domestic factors that were under Malaysian control were not addressed, Malaysia risked spiralling downwards from its current upper middle income economy position.

Institutional degradation was one of the key reasons that the NEAC report put forward as the cause of Malaysia's declining economic performance. It did not provide an explanation of how its authors arrived at that conclusion. There was also no attempt to provide analysis of how institutions had impacted on the Malaysian economy.

The ambiguity in understanding the role of institutions, the middle-income trap and long run economic growth in Malaysia raise two important questions that are addressed in the thesis: (i) what are the domestic institutional issues that are constraining Malaysia's economic growth and its ability to overcome the middle-income trap; and (ii) what then are the possible institutional reforms needed to facilitate Malaysia's return to a high growth path?

This chapter revisits the approach to answering these two research questions and is structured as follows. The following section summarises the middle-income trap concept and its theoretical underpinning followed by a summary of the key concepts and definitions used in this study. The subsequent section highlights the key findings that provide the basis for developing possible recommendations to correct these institutional weaknesses. The chapter concludes by highlighting the contribution of the thesis towards understanding the importance of the role of institutions in human capital development in Malaysia directed at overcoming the middle-income trap, and raises the limitations of this study as well as recommending future research areas.

MIDDLE-INCOME TRAP, INSTITUTIONS, HUMAN CAPITAL DEVELOPMENT AND INCOME INEQUALITY

Chapter 1 also discussed the middle-income trap. The standard explanation of the middle-income trap is that low income countries can compete in international markets by producing labour intensive low cost products, in which they have comparative advantage, using technologies developed abroad. Large productivity gains occur through a reallocation of labour and capital from low productivity agriculture to high productivity manufacturing through policy change and reform that connects the domestic economy to international market opportunities. As countries reach middle income level, the underemployed rural labour force shrinks and wages rise, eroding competitiveness in labour intensive activities. Productivity growth from sectoral reallocation and technology catch-up are eventually exhausted, while rising wages make labour intensive exports less competitive internationally. If countries cannot increase productivity through innovation in products and processes, they find themselves trapped as they are unable to compete with lower cost producers and technologically superior producers in international markets.

Chapter 1 discussed the different approaches used to explain the middle-income trap. There are currently four broad approaches that seek to explain the middle-income trap. The growth theory approach explains that lower income economies tend first to diversify, where the economic activity is spread more equally across sectors; then, at a relatively late stage in the development process, when per capita incomes are high, these countries start specialising again. Two related theories that are also important in explaining the importance of specialisation within this approach are the new trade theory and new economic geography. These theories argue that economies of scale and economies of agglomeration forces firms to produce for the global market and also to relocate to particular geographic regions which have comparative advantages in the production of certain goods and services (Gill and Kharas 2007). Governments of countries facing the middle-income trap will have to ensure that their institutions facilitates firms in achieving economies of scale and economies of agglomeration for

the products and services that the firms have comparative advantage in order to achieve high growth rates beyond the middle-income level.

The second and third approaches are conceptually similar. In the 'economic development' approach, poor countries are first caught in a poverty trap or a low level equilibrium trap as discussed by (Rostow 1969 and Hayami 1998 cited in Easterly 2006). To overcome this trap, a 'big push' is needed, usually through massive capital infusion to meet the short-fall in the savings-investment gap or at a turning point when they exhaust surplus labour. When countries experience growth slowdown and stagnation at the middle-income level, a similar strategy is required to achieve take-off beyond the middle-income level. Malaysia's New Economic Model is premised on this approach (NEAC 2010a).

The 'industrial structure' approach is similar to the stages of development explanation but focuses on industries, in particular, the manufacturing sector (Ohno 2009). Here, countries that follow the East Asian model of industrialisation are stuck in a middle-income trap if they are unable to develop indigenous capital and technology, and domestic capabilities in industrial production. In both these approaches, the activities using unskilled labour remain the same – intensive and repetitive – although there is a transition in the form and content of production as the economy transitions from agricultural production to early stage industrialisation. Graduating from the middle-income trap requires skilled labour to undertake more creative and complex work.

The final and most recent attempt to explain the middle-income trap is an institutional evolution approach within the context of economic development (Aoki 2011). This approach used two East Asian economies – China and Japan – as examples and compared their institutional evolution as their economies developed. In this approach, economic development is divided into five phases: the Malthusian phase of the poverty trap; the government-led development phase; the Kuznets process in which development is realised through structural shifts; the human capital-based development

phase; and the post demographic transition phase. In this approach, countries that are stuck in the middle-income trap have difficulty moving through the Kuznets-phase onwards because their institutions have not evolved to support the next phase of economic transformation.

The New Economic Model incorporates all of what these theories are putting forward. It focuses on 'the big push' through eight strategic reform initiatives[75] which were later revised to six as described in Table 55. The strategic reform initiatives are focused on reforming organisations, resource allocation, legal structures and regulations, and government practices in these four areas: (i) the creation of a competitive environment; (ii) development of a quality workforce; (iii) transformation of the government so as to improve its service delivery to support the private sector and become fiscally sustainable; and (iv) promoting inclusiveness. These strategic reform initiatives are operationalised through the Government Transformation Programme, Economic Transformation Programmes and the 10th Malaysia Plan.

Distilling these four theories within the context of a global economy, it can be concluded that for Malaysia to overcome the middle-income trap, two things would have to happen. First, growth will have to be driven endogenously through high human capital formation, mastery of technology, and innovation in products and processes. Second, structural change is needed where the Malaysian economy specialises in a select number of higher value added products and services that are globally competitive. The question then becomes whether Malaysia has the institutions that can facilitate the above two transitions?

The literature review in Chapter 1 highlighted the fact that many studies have been conducted on the nature and cause of Malaysia's weakening economic

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[75] The New Economic Model Part 1 (2010) had listed eight strategic reform initiatives (SRIs) that the government would have to address. They are: (1) re-energising the private sector to drive growth; (2) Developing a quality workforce and reducing dependency on foreign labour; (3) Creating a competitive domestic economy; (4) Strengthening the public sector; (5) Transparent and market-friendly affirmative action; (6) building the knowledge base and infrastructure; (7) Enhancing sources of growth; (8) Ensuring sustainability of growth. These 8 SRIs were later reduced to six. This SRIs are more focused and is described in Table 55.

performance including the NEAC's two part New Economic Model report. Most of these studies, including the NEAC report, stopped short of investigating the deeper reasons or root causes for the declining economic performance. The thesis has attempted to contribute in this area – to investigate the institutional reasons for the declining economic performance through analysis of human capital development and income inequality in Malaysia's manufacturing sector.

The methods employed to undertake this analysis were two-fold. Chapter 2 began by surveying the economic growth literature to identify and understand what the determinants of economic growth were. This literature review identified the proximate as well as the deeper determinants of economic growth. The proximate causes of economic growth are the growth of factors of production such as physical and human capital, while deep determinants are factors such as geography, trade and institutions. There are convincing arguments and empirical support that suggests that, while all these factors contribute towards economic growth, it was institutions that were the most important. This is because institutions function as the meta-structure through which the other deep determinants such as trade and geography interact with proximate factors such as labour, capital and technology, notwithstanding the fact that all these factors also influence institutions. How institutions are constructed and reformed therefore is critical to explaining the varying performance of the different economies, and also the changing performance of particular economies over time.

While there is consensus that institutions play a key role in economic growth, there is no clear consensus on what institutions are. Despite attempts to define institutions, there is little consensus on how to apply the concept of institutions analytically. Furthermore, measuring institutions, according to their various definitions, remains a daunting task. This study follows North's (1991) definition of institutions as the rules of the game and organisations and their agents as the players in the game. The Governance Indicators was used for the purpose of measuring the quality of institutions and Hollingsworth (2000) schema that mapped institutional resistance to change as the

criteria for mapping institutions, used for the purpose of classifying the relevant institutions.

The next step was to undertake an empirical analysis of how institutional quality affected economic performance. A stochastic frontier production function, where the institutional variables were the variables of interest, was used to determine and rank Malaysia's economic performance over time and in relation to other countries. This approach allowed for a comparative perspective across countries, the evolution of the performance of a single country over time changes and the impact of institutions on economic performance at the aggregate level. In order to have a more comprehensive and in-depth institutional analysis, the study used a case study approach on a chosen factor of production. The factor that was selected was human capital in the manufacturing sector. Both human capital and the manufacturing sector were selected for their importance to the Malaysian economy and their key role in economic growth.

KEY FINDINGS AND CONCLUSIONS

Chapter 4 tested two hypotheses: (i) do institutions matter for economic efficiency;[76] and (ii) which institutions matter at the different levels of economic development. The results showed that institutions, measured through the Governance Indicators, mattered in improving economic efficiency. Overall, institutions related to 'Government Effectiveness'[77] had the strongest impact on economic efficiency when compared to institutions relating to 'Voice and Accountability', 'Political Violence', 'Regulatory Quality', 'Rule of Law', and 'Control of Corruption.' This result, across countries, for the period 1990 to 2008, supports the perspective that economic

[76] Economic efficiency is the numerical measurement of the performance of a particular unit – in this case, a country – by identifying 'best practice' and evaluating that economic unit's performance relative to the best practice frontier.

[77] 'Government effectiveness' captures the perceptions of the quality of public service, the quality of the civil service and the degree of independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

performance[78] was not influenced so much by regime type, but rather by how effective[79] the regime was.

This may partly explain how countries such as China, Malaysia and Vietnam, while having relatively poor performance in other categories such as 'Rule of Law', 'Control of Corruption' or 'Voice and Accountability', can have still generate high growth rates because of their good performance in the category 'Government Effectiveness.' These governments, although largely undemocratic and corrupt, have been successful in developing policies that have improved the welfare of the majority of their citizens. These governments' ability to generate economic growth by attracting foreign direct investment, providing political stability, managing industrial relations, investing in infrastructure, social services and successfully distributing the economic growth to a large segment of their poor population are examples of government effectiveness.

At higher levels of income, the institution that matters most is 'Rule of Law'. 'Voice and Accountability' was also important but wrongly signed. This suggests that the increase in democratic rights initially at least had a negative impact on economic efficiency. This can be explained from the perspective that as the individual's welfare increases, the demand for democratic participation is also likely to increase. As the Arrovian impossibility theorem suggests, taking into account the interests of every individual and group can be a source of 'inefficiency'.

Secondly, the results for countries in the upper middle income level of development, such as Malaysia, reveal that the institutions that mattered were related not only to 'Government Effectiveness' but also related institutions such as 'Control of Corruption' and 'Rule of Law.' In the stochastic model, Malaysia's economic performance improved from achieving 45 per cent of its potential in 1990 to 61 per cent of potential in 2008. These two observations together suggest that if Malaysia improves

[78] Economic performance here means a country's actual performance relative to its potential performance.
[79] Effective as defined in 'Government Effectiveness' in footnote 2.

its institutions such as its 'Government Effectiveness', 'Control of Corruption' and 'Rule of Law', then Malaysia's economic efficiency could improve further.

As a country achieves high income or developed economy status, 'Voice and Accountability' becomes the most significant governance variable. This reflects the demand from individuals for increased democratic participation as their income level rises. However, the variable is negatively signed meaning that 'Voice and Accountability' reduces economic efficiency. As discussed in Chapter 3, empirical tests on whether democracies are good for growth are not conclusive (Brunetti et al. 1998), and this result suggests the need for even more empirical work in this area. The combined outcome of all six governance indicators point to democratic countries' ranking the highest in the empirical analysis. The results do face the issue of causality: whether higher incomes lead to better quality democracy or does democracy lead to higher economic growth? While there is still no consensus on this issue, there is strong evidence that the nature of economic activities at high levels of income, based as they are on knowledge generation and creativity, can only flourish sustainably in free societies.

Chapter 5 and 6 provide case studies for the institutional analysis. Chapter 5 uses a stochastic production frontier function to estimate the contribution of the different levels of human capital to manufacturing sector output for the period 2000-2005. The results from this analysis show that capital investment and local labour made the most significant contribution to output growth in the manufacturing sector while the contribution of foreign labour was not significant. When the contribution of local and foreign labour towards technical efficiency in the manufacturing sector were studied further, the results showed that it was the local unskilled labour that contributed most significantly towards technical efficiency. Local skilled labour's contribution was negligible and the semi-skilled labour's contribution was negative.

Foreign skilled and semi-skilled labour also did not contribute positively to improving technical efficiency in the manufacturing sector. Rather, as with local labour,

it is foreign unskilled labour that contributes positively to technical efficiency in the manufacturing sector. These observations can explain the low level of technology adoption in Malaysia's manufacturing sector. This observation also supports the literature which argues that entrepreneurs use technology to complement the skills level of its labour. Low skilled labour available in the manufacturing sector is complemented with low level technology. Hence, the outcome the high percentage of unskilled and semi-skilled labour in the manufacturing sector is increasingly detrimental to Malaysia's efforts to overcome the middle-income trap.

Chapter 6 analysed three important transmission channels of income inequality in the manufacturing sector. Firstly, the analysis showed that an increase in the share of skilled foreign labour reduced the wage gap between skilled and unskilled labour. Additionally, an increase in unskilled labour in the manufacturing sector increases the wage gap between skilled and unskilled labours. This follows from conventional theory that increased supply in either skilled category lowers the wage premium of its labour. In general, increased supply of foreign labour in either category is expected to lower wages, other things remaining the same.

The results also showed that increasing capital investment tends to increase the wage gap. The increase in new capital investment in machinery and technologies in manufacturing industries increases the demand for skilled labour but not for unskilled labour. This has resulted in an increase in the wage gap between the skilled and unskilled labour. This study could not determine whether this phenomenon is temporary or persistent. However, a government policy that restricts the free movement of skilled labour, but allows for a relatively free movement of unskilled labour in the manufacturing sector, is most likely to have contributed to this outcome. The results also showed that the share of semi-skilled labour and in particular the share of semi-skilled foreign labour increased the wage gap. The increasing demand for semi-skilled labour is mainly due to the structural adjustment of certain segments of the

manufacturing sector to higher value-added activities that Malaysia was experiencing (World Bank 2012).

The results also clearly indicate that technology is not the cause of the widening wage gap in the Malaysian manufacturing sector as the R&D interactive term is not statistically significant. In contrast, trade (exports and imports) contributes to the widening wage gap in the manufacturing sector.

The empirical analysis also demonstrated that the interactive terms of exports and share of semi-skilled foreign labour tend to be negative, indicating that greater flow of semi-skilled foreign labour tends to lower the wage gap between skilled and unskilled labour.

The findings from Chapters 5 and 6 indicate that the manufacturing sector's output derives primarily from the unskilled and semi-skilled labour inputs. Moreover, firms have also adopted a low technology regime to complement their predominantly low skilled labour input to maximise outputs. The reliance on unskilled and semi-skilled labour input has exacerbated wage inequality in the manufacturing sector. It can be inferred from this empirical analysis that the primary contributors to rising wage inequality in the manufacturing sector result from competition from lower cost producers and the unregulated flow of unskilled and semi-skilled migrant workers.

DEEP CAUSES OF INSTITUTIONAL WEAKNESSES

Chapter 7 advanced three reasons behind the low human capital formation and rising wage inequality in Malaysia's manufacturing sector and identified the institutions responsible for this. First, Malaysia's education and training institutions have failed to produce skilled labour in sufficient numbers and quality. Second, skills development through training, retraining and up-skilling in the manufacturing sector has not produced the required human capital with the appropriate skills.[80] The private sector linkages and

[80] These trainings can take place onsite (on the job/shop floor) and off-site (specialised training centres), and in a formal (accredited and structured programmes) or informal (in house or industry wide through voluntary exchanges) manner.

public-private sector partnership necessary for this training to be effective have yet to be developed. Third, labour policies in the manufacturing sector provide incentives for firms to rely on unskilled or low skilled labour rather than high skilled labour.

The institutional reforms that are needed to facilitate further human capital development, product and process innovation and address income inequality in the manufacturing sector is therefore closely associated with improving the skills level of the workforce in the manufacturing sector and addressing affirmative action that focuses on employment and equity targets. These proximate solutions are well known and have been articulated through many government documents, studies and consultancy reports since the early 1990s.[81]

The discussion in Chapters 5, 6 and 7 demonstrates that these institutions and the institutional reforms undertaken through various government policies, thus far have not delivered on their objectives. The latest strategies and policies to address these challenges have been broadly articulated through the New Economic Model, the Government Transformation Programme (GTP), the Economic Transformation Programme (ETP) and the 10th Malaysia plan which emphasised and prioritised improving institutional efficiency, human capital development and innovation capability.[82] More specific policies relate to implementing productivity-enhancing structural reforms such as improving the skills of the labour force, the emphasis on the quality, and not the quantity in the accumulation of capital, private rather than public endeavours in promoting competition and investment, bottom-up rather than top-down decision making in more decentralised and participative process; unbalanced rather than the balanced regional growth with an emphasis on industrial clusters; selective and targeted incentives rather than sector based approaches; and making better use of foreign skilled labour.

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[81] Tables 53 and 54 in Appendix 4 provides the evolution of industrialisation and a list of policies that were targeted at promoting economic growth through human capital development, and ameliorating incoming inequality through industrial and technological upgrading in Malaysia.

[82] Tables 55 to 60 provide a brief analysis of reform measures under the ETP and GTP relating to human capital development and income inequality.

In Chapter 4, the results from the stochastic model provided the rationale that if Malaysia improved its 'Government Effectiveness', 'Control of Corruption' and 'Rule of Law', then Malaysia's economic performance could improve further. This is supported by the two case studies and the subsequent discussion in Chapter 7. Delving deeper into the three reasons advanced to explain the mediocre performance in human capital development and rising income inequality in the manufacturing sector, the importance of the institutions of 'the state' and its policies becomes clearer. The state is ultimately responsible for developing and implementing the policies that determine the effectiveness of the education and training institutions, public-private partnership in human capital development and labour policies. Private sector initiatives in human capital formation are also influenced by government policies.

What then are the possible deeper reasons for Malaysia's inability to develop human capital and reduce income inequality?

In Chapter 1, Malaysia was identified as a competitive authoritarian regime. The ruling coalition consists of 13 political parties with the United Malays National Organisation (UMNO) functioning as the backbone of the coalition. [83] Almost all of the parties in the coalition are ethnically based or are dominated by a particular ethnic group or region. UMNO uses its ethno-nationalist ideology of Malay supremacy, concurrently with objectives such as 'national unity' and 'social stability', to achieve primacy as the other ethnic communities neither have size (numerical superiority) or scope (are limited to certain geographical areas). UMNO has implemented policies that while placing emphasis on economic growth, are not entirely devoid of the need to control key institutions of the nation: the government, religion and culture, economic and political process (Wade 2009; Case 2010; Brownlee 2007). In doing this, UMNO has created meta-rules and norms that influence all other institutional levels. This has fundamentally impacted Malaysia's institutions. The most vivid illustration of UMNO's dominance is Malaysia's public sector which is overwhelmingly Malay – the politically dominant

[83] Read 'The origins and evolution of ethnocracy in Malaysia', Wade (2009) for a survey of these issues.

racial group.[84] This is also true for publicly funded education and training, and the research and development institutions.

Table 49 provides the main affirmative action institutions in relation to labour. Affirmative action has provided Bumiputeras, especially Bumiputera Malays with easy access to education and also employment in the public sector, government linked corporations and various agencies that are funded by the government. This democratisation of educational opportunities for the Bumiputera community has however eroded the quality of education.

[84] The Centre of Public Policy Studies (CPPS) noted that in 2006, the proportion of Malays in the civil service has grown from 60% to 77% since 1970. The elite Malaysian Home and Foreign Service (Perkhidmatan Tadbir dan Diplomatik/PTD) was 85% Malay (CPPS, 2006).

Table 49 Summary of affirmative action programme and key features

Area	Programmes	Notable features
Tertiary education	Residential colleges;	Exclusively Bumiputera (Until 2000)
	Matriculation colleges	Exclusively Bumiputera (until 2002)
	Expansion of tertiary institutions, enrolment quotas	Extensive growth of Bumiputera in tertiary education; concerns over decline in quality
	University scholarship	Important in facilitating access to university education but lacking a systematic framework for balancing merit and need considerations in the awarding of scholarships
Upper level occupations	Public sector employment	De facto quota, largely ad hoc in implementation; major role in absorption of a growing urbanised Bumiputera population and growth of Bumiputera professionals and administrators
Industrialisation	Industrial Coordination Act	Minimal impact at professional and managerial level; no impact on SME
Enterprise and managerial development	Public enterprises	Spanning all sectors, but largely underperforming or failed; post-1997 crisis – government linked companies given mandate to spearhead BCIC agenda.

Source Lee, (2012).

The manner in which the Bumiputeras have been allowed a preferred position in the public sector has contributed to mediocre human capital formation. Take as an example student educational achievement. In Malaysia, the public education system provides education to the majority of Malaysians at all education levels while the private sector plays an important role at the pre-tertiary and tertiary levels. There are several variables that contribute to educational outcomes – the student, the curricula, the

policy, the principal, the school environment, the teacher, the various teaching strategies, and the home.[85] While the government has less control over the student and the home, it has significant control over 'within school' factors. The within school factors can be categorised into infrastructure (school environment and facilities), teaching and administrative resources (the principal, the teacher and teaching strategies) and curricula. Another key factor is the resources to finance these factors.

Malaysia has one of the highest levels of expenditure on education, either as a share of GDP or total government expenditure, in the region and when compared to its comparators (Chapter 5). In terms of infrastructure, Malaysia's public education infrastructure is also deemed to be of high standard (UNESCO 2012). This leaves teaching quality and the curricula as the 'within-school' factors that contribute to Malaysia's mediocre educational outcomes. This logic can also be extended to the publicly funded technical, vocational and community colleges and also to the public sector universities. All are well funded yet have mediocre outcomes.

Chapter 7 reported that the quality of graduates from Malaysian universities is poor. Most of the weak Bumiputera graduates join the public sector. A large percentage of them would opt to become teachers. Hence, if teacher quality is the most important factor among 'within-school' factors to determine student achievement, it is not surprising that Malaysian student achievements are mediocre. Although the government under the Government Transformation Programme has introduced several significant measures to improve teacher quality, none addresses the deeper cause of ethnic division in Malaysia, the lack of meritocratic selection criteria in the public sector and the lack of transparency. [86]

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[85] Within-school factors are factors that the state and its agents (the school) should control over. 'Out of school' factors such as parenting, neighbourhood and socio-economic background are also very influential in determining educational outcomes for the individual student. This thesis does not discuss the out of school factors.

[86] Tables 56 and 57 are reform measures introduced by the present administration. None identify meritocracy as a first principle.

Table 50 Distribution of occupation by race group, percentage of Malaysia employed population, 1970-2005

Occupation	Bumi-putera	Chinese	Indians	Bumi-putera	Chinese	Indians
	1970			**1990**		
Admin and managerial	22.4	65.7	7.5	30.3	65.5	4.2
Professional and technical	47.2	37.7	12.7	62.2	29.9	7.9
Excl. teachers and nurses	...	...	...	58.0	33.2	8.8
Teachers and nurses	...	...	...	68.8	24.7	6.4
Overall	51.4	37.0	10.7	56.3	34.6	9.1
	2000			**2005**		
Admin and managerial	36.6	55.8	6.6	37.1	55.1	7.1
Professional	57.3	33.5	7.9	58.5	31.9	8.2
Excluding teachers and lecturers	45.4	44.2	9.3	47.2	42.0	9.6
Teachers and lecturers	74.4	18.2	5.8	74.9	17.4	6.2
Technicians and assoc. pro	59.5	30.3	9.5	59.5	29.7	10.0
Excl. teachers and nurses	54.6	34.0	10.8	55.2	32.9	11.2
Teachers and nurses	71.1	21.4	6.4	70.6	21.5	6.9
Overall	56.4	32.5	9.1	56.5	32.4	9.3

Source Lee, (2010).

Another significant problem that is generated by the ethno-nationalist strategy of the ruling party is that it creates an adversarial situation between Malays and non-Malays, the Chinese in particular. This is played out especially in the political sphere but also in the administration of the country. The public sector is dominated by Malays and the private sector, and most especially the manufacturing sector, is dominated by Malaysian Chinese.[87] This adversarial system and several high profile incident where

[87] Article 160 of Malaysia's Federal Constitution defines Malay as someone who habitually speaks the Malay language, practises Malay culture and embraces Islam. Hence, all Malays must be Muslims through the force of law, but not all Muslims need to be Malay. There is no legal definition for Bumiputeras (indigenous Malaysians). Bumiputera is operationalised through policies and regulations

the property rights of minority communities have come under threat of hostile takeovers legally or illegally and the threat of expropriation has contributed to mistrust especially of Chinese owned small and medium scale manufacturing firms of government initiatives. This supports the literature that the lack of social has capital undermined economic growth

Table 51 Tertiary educated managers and professional and total tertiary-educated employed person, Bumiputera and non-Bumiputera, 2000 (per cent)

	Bumiputera	Non-Bumiputera
Total employed	58.0	42.0
Public sector managers	85.0	15.0
Private sector managers	40.9	59.1
Public sector professionals	80.3	19.7
Private sector professionals	43.9	56.1

Source Lee, (2012).

Since the late 1960s, the Government of Malaysia has been systematically taking over strategic business owned by ethnic Chinese and Indian Malaysians, but also of foreign interests'. Heng (1996) captures this conscious long term political objective of the Malay polity in the following manner:

> The Malay nationalist leadership agreed on a common political, economic, and cultural agenda. The first, and most pressing priority, was to regain sovereignty and control of their homeland from the British. The economic agenda of addressing Malay backwardness and closing the income gap between Malays and Chinese was to be achieved after the attainment of Malay political hegemony. The cultural agenda was to build the new nation state on Malay cultural attributes: Islam and the Malay language…Malay political and cultural ascendancy was initially acknowledged by the British in the 1948 Federation of Malaya agreement, and subsequently entrenched with the promulgation of the 1957 independence constitution. The economic agenda, however, was not implemented until after 1969.
>
> Heng (1996, p. 33).[88]

which then has the force of law. Bumiputeras include Malays (on Peninsular Malaysia) and non-Malay Bumiputeras (in Sabah and Sarawak). Approximately 7 per cent of Bumiputeras are not Muslims.

[88] Heng (1996), 'Chinese responses to Malay hegemony in Peninsular Malaya 1957-1996', *Southeast Asian Studies*, pp. 32-55, 34:3 provides an overview of the strategies taken by the Chinese community in Malaysia, in response to the Federal Government's actions in promoting Malay interest.

The non-Malay/Muslim community, especially the Malaysian Chinese community have been reminded on a regular basis of the discretionary powers of the state. The Industrial Coordination Act, 1975 (ICA 1975) is one such of those but the coercive powers of the state extends beyond the ICA 1975 to include the lack of checks and balance usually associated with a democracy. [89] For example, there is a strong perception that the judiciary does not provide adequate redress in disputes with the government or with an individual who has the support of the government. This matter is further exacerbated by a predominantly Malay public sector regulating a predominantly Chinese manufacturing sector as evidenced in Tables 50 and 51. The most pertinent example is that almost 95 per cent of domestic manufacturing firms in Malaysia prefer to remain below the ICA 1975 thresholds to avoid being subjected to the discretionary powers of the state. The scale of Malaysian manufacturing firms can be argued as explored in Chapter 5 has debilitating effects of technical efficiency. Furthermore, overcoming the middle-income trap requires firms to achieve economies of scale, something that the ICA 1975 may be hindering.

The ethno-nationalistic strategy of the ruling party also point to several other worrying trends that highlights fundamental weaknesses in Malaysia's institutions.

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[89] After the riots of May 13, 1969, and beginning with the Second Malaysia Plan (1971 – 1975), the government began with earnest to assist Malay (and Bumiputeras) but also sought domination in other political and cultural fields. The New Economic Policy, the New Educational Policy and the National Cultural policy which were all introduced in the 197—71 period when Malaysia was under Emergency rule (and Parliament suspended) because of the riots, were aimed at propagating a Malaysian national culture and economy that were dominated by Malay and Islamic elements (Heng 1996). Two vivid examples relating to foreign interests are the Petroleum Development Act 1974 which created PETRONAS (Malaysia's national oil company) and gave it exclusive rights and powers over Malaysia's hydrocarbon resources (World Bank 2008); and the 'Dawn Raid' on 7th September 1982, which saw the Malaysian government owned investment agency take control of British controlled plantations such as Guthrie, Dunlop, Harris and Crosfield (SS Rajah 2012; White and Yaakob 2010). In relation to domestic interests, other than the Industrial Coordination Act 1975, government directives that stipulate only Bumiputera or firms with substantial Bumiputera interests are privy to government [at all levels] and government linked corporation procurement (Menon in Hill et al. 2012), the consolidation of the financial sector after the East Asian Financial Crisis 1997/98 which reduced the number of banks and financial firms – which were mostly Malaysian Chinese owned – from more than 40 to currently only 2 (Lai 2007 and see Table 61), and the dominance of Malaysian government linked companies or corporations (GLCs) – in 2009 GLCs had a market capitalisation of 49 per cent of the Kuala Lumpur stock exchange (Bursa Malaysia) – have seen the private sector which has a significant Malaysian Chinese and foreign investors ownership crowded out (Menon 2012).

These problems go beyond challenges related to managing the economy but towards how Malaysian society views Malaysia's long-term sustainability.

An estimated 1 million Malaysians have migrated with almost a third being skilled labour. Almost 50 per cent of them are ethnic Chinese and are working in Singapore, Malaysia's neighbour. The three main reasons provided by respondents in a survey undertaken in this report were that there were limited career prospects, social injustice and poor compensation in Malaysia (World Bank 2011).

A report by Global Financial Integrity (GFI) ranked Malaysia at number five in terms of illicit financial outflows. Malaysia ranked higher than other larger countries that are known to be corrupt such as India, Indonesia, Myanmar, Nigeria and the Philippines. The outflow from Malaysia in 2000 was US$22.2 billion and tripled to US$68.2 billion in 2008 with a total cumulative illicit outflow of US$291 billion. In 2009 alone, GFI estimates that approximately US$47 billion was illegally siphoned out (Global Financial Integrity 2011). In a separate report by the Tax Justice Network (TJN), Malaysia was among the top 20 countries when it came to capital flight. TJN estimated that from 1970 to 2010, approximately US$283 billion had been transferred to tax havens from Malaysia (The Guardian 2012). To provide a context for this illicit outflow, net foreign direct investment inflows into Malaysia over the period 2000-2008 was only US$41 billion (World Bank 2009), or Malaysia's public debt in 2011 was US$75.5 billion (World Development Indicators 2012).

Improving government effectiveness, rule of law, control of corruption[90] and ameliorating inter-ethnic tensions are key to Malaysia overcoming the middle-income trap. Hence, beyond the stated economic and social reforms put forward in policies to overcome the middle-income trap and to restore confidence in Malaysian institutions such as the Government Transformation Programme or the Economic Transformation Programme, the Malaysian government will need to move away from racial based policies, and develop institutions including policies that are based on efficiency

[90] As defined by the Governance Indicators investigated in Chapter 4

considerations and/or on merit. Doing all of this will not only set the institutional foundations on the correct footing but also enable the adversarial nature of Malaysian politics of Muslims against non-Muslims or Malays against non-Malays to be ameliorated.

Affirmative Action in Malaysia – Genesis and Contemporary Impact

It would be wrong to think that affirmative action only began in 1970. It would also be wrong to think that the current political settlement is of recent origin. The nature of Malaysian polity, and the entrenchment of the idea of 'Malay special privileges/rights'[91] has its antecedents to almost 200 years ago.

The concept of 'Malay special privileges/rights' originated with the British colonial rule in the Federated States of Malaya in 1874. The underlying philosophy was the idea that even though Malaya was under colonial rule, a myth was created that the Malays were still the rightful owners of the 'land'. This myth should and could be maintained by granting the Malays 'special status' and 'protection' by the British (Lim, 1984). There would be two layers of protection: the Malay rulers who would continue to 'protect' their Malay subjects, and in turn, the British colonial government would protect the interests of the Malay rulers and the Malays in general from being over-run by the non-Malays, in particular the Chinese migrants. Malay peasantry (paddy farmers, fisher-folks, etc.) would be protected in their traditional mode of existence from the modern sector and the incoming migrants while the Malay ruling elites were also protected in matters of governance by allowing them to retain symbolic sovereignty and offering them generous compensation.

In 1913, the Malay Reservation Enactment was passed which designated certain areas to be reserved for Malay ownership only. The act also prohibited non-Malays from holding mortgages on Malay reservation land. This was in response to the expansion of agriculture owned by Chinese migrants and British colonialists into Malay

[91] While the Malaysian Federal Constitution provides for privileges for the Malays in certain areas, Malay ethno-nationalists have interpreted these privileges as rights.

land (KS Jomo, 1986). This was followed by the Rice Land Act, which is related to the Malay Reservation Act that prohibited the Malays from cultivating any crash crop other than rice on reservation land. The concept of 'protection' extended also into the fields of education and public employment. The Kuala Kangsar Malay College (MCKK) was established in 1905 to provide English education and upper-class English culture to children of Malay aristocrats to nurture a local ruling class that would serve as junior partners to the colonialists. The declared policy was to fill the burgeoning Malayan Administrative Services (MAS) with Malays.

The British policy of 'Malay special privileges/rights' was conceived out of the need to assuage the Malay populace into whose life the British had intruded. While all of these created a peaceful coexistence between the colonialists and the Malay majority community, it however implanted the seeds of suspicion and separatism between the Malays and the migrant communities. It also created a situation where the Malays while being economically disadvantaged were politically superior because of British patronage. Furthermore, as decolonisation took place, a compromise was achieved wherein the non-Malays, in return for receiving citizenship based on the principle of *jus soli*, agreed to having limited special privileges in terms of scope and time length conferred to the Malays in order to uplift their economic situations. There forth, Malay special privileges were enshrined in Article 153 if the Malaysian Federal Constitution of 1957.

There are two distinct phases in post-independence affirmative action programme; the first from 1957 to 1970, and the second, since 1970 until present. In the first phase, the special privileges programme was a continuation from the pre-independence period with additional privileges for Malays to enter into the modern sector and to attain economic parity with the non-Malays (specifically the Chinese). Article 153 of the Federal Constitution specifically refers to the need for Malays to make inroads into the field of public service, education, and business. Despite making

some progress in the first two areas, this phase ended with the May 13, 1969 pogrom (Soong, 2007).

The May 13, 1969 pogrom provided the impetus for launching the New Economic Policy (NEP), considered to be the world's most extensive affirmative action programme that had a twofold goal: to eradicate poverty and to restructure society and the economy, so that the Bumiputeras would have a at least thirty per cent employment in, and ownership of the economy by 1990.This saw the rapid scaling up of government support to the Bumiputera community in public and private sector employment opportunities (seven prestigious professions were identified in which a 30 per cent target was set for Bumiputera' s achievement), education (quotas in public universities; scholarships; dedicated schools, technical and community colleges, and universities), business licenses, provision of credit and various training, ownership and management programmes; rural land development schemes; and corporate, equity and asset ownership. While the NEP had ended as a policy in 1990, the thrust of the affirmative action policies continues. Although the affirmative action have been in place for forty-three years, the government claims that it has yet to meet its objectives of 30 per cent equity ownership for the Bumiputeras. Affirmative action, instead has come to be associated with all the malaise in Malaysia from declining foreign direct investment and the crowding out of private investment (Menon, 2012), institutionalised corruption (Narayanan in Hill et al., 2012) and rampant corruption (CIS, 2011), dampening entrepreneurial capacity and capabilities (Gomez in Hill et al. 2012, Rasiah in Hill et al. 2012) and poor quality human capital development (Lee and Nagaraj in Hill et al., 2012).

The key issue, as demonstrated in this study, is that the politically dominant Malays argue that these 'privileges' are their 'rights' (Level 1), and are therefore non-negotiable (de facto), and not a privilege as understood in law (de jure) that can be removed. The outcome, as had been experienced in the past 40 years or so, is the continued expansion of affirmative action in Malaysia. Successive political leaders,

since the second Prime Ministers, from the ruling coalition have used this to consolidate their power, but have inadvertently painted themselves into a corner as any strategy to reform is likely to undermine their political base.

CONTRIBUTIONS OF THE THESIS AND FUTURE RESEARCH DIRECTIONS

This thesis has contributed to a better understanding of the impact of human capital development on manufacturing sector output in Malaysia and the increasing trend of income inequality in the manufacturing sector. The thesis measured the impact of the quality of institutions on economic performance and reported that that Malaysia was only performing at 60 per cent of its economic potential. The thesis was also able to determine which institutional quality was important in influencing economic growth at which particular level of development. If the government of Malaysia is interested in graduating from the middle-income trap, it must further improve its governance indicators in the 'Rule of Law' and 'Control of Corruption' areas in addition to 'Government Effectiveness.'

Institutional analysis offered reasons for Malaysia's poor human capital development and rising income inequality in the manufacturing sector. By analysing the deeper causes of the institutional weaknesses, the thesis provided a plausible argument that the ruling party's ethno-nationalist ideology is one of the major factors that have led to the current predicament of Malaysia's manufacturing sector. More critically, due to the fact that ideologies are institutions (norms) that are the most difficult to change, it is likely that UMNO's ideology of ethno-nationalism will become a major impediment to the efforts of the government to undertake reforms. This is already evident in the failure of the present administration to implement its stated reform agenda.

Within the context of the middle-income trap, the thesis therefore argues that the most important obstacle that Malaysia has to overcome is its institutional structure, if it wants to graduate to a higher income level. The government of Malaysia in 2010 laid out policies and strategies that focused on a big push of institutional reforms to overcome the middle-income trap. Although some political will has been demonstrated

by the Prime Minister (Najib Razak), this thus far, has not delivered significant reform (Hill et al. 2012). The Prime Minister's conflicting stance on his key reform measures and his inability to reform the fundamental ideological basis of his political party are the main reasons for the lacklustre performance.

The most important area for further research would be to analyse ways to implement the required institutional reforms or strategies to overcome the institutional constraints created by the ruling party and its ethno-nationalists ideology. More specifically, research is needed in two areas: (1) on how the Malaysian government can successfully exit from the extensive affirmative action programmes that it has created over time; and (2) research on strategies on how the Malaysian government can divest its direct involvement in the Malaysian economy through its government linked corporations and investment agencies. This thesis has demonstrated that unless the Malaysian government is capable of undertaking these two reforms successfully – to complement other current reform measures – Malaysia is likely to remain trapped at the middle-income level.

Appendices

APPENDIX 1 CHAPTER 4

Figure 20 Relationship between output per worker and capital per worker

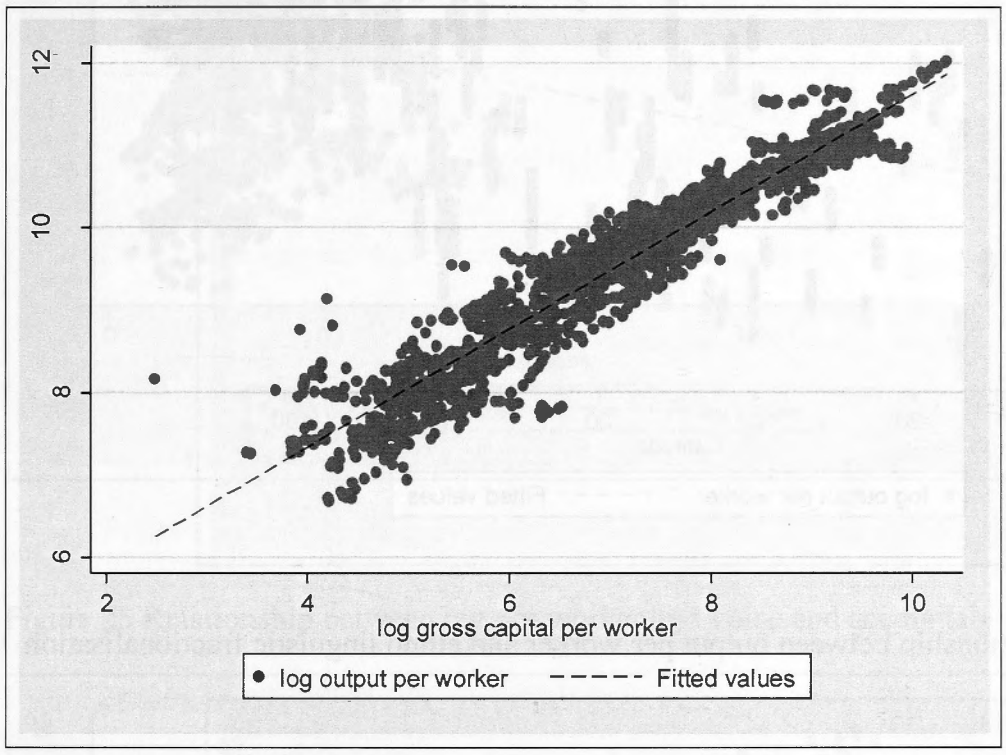


Figure 21 Relationship between output per worker and human capital per worker

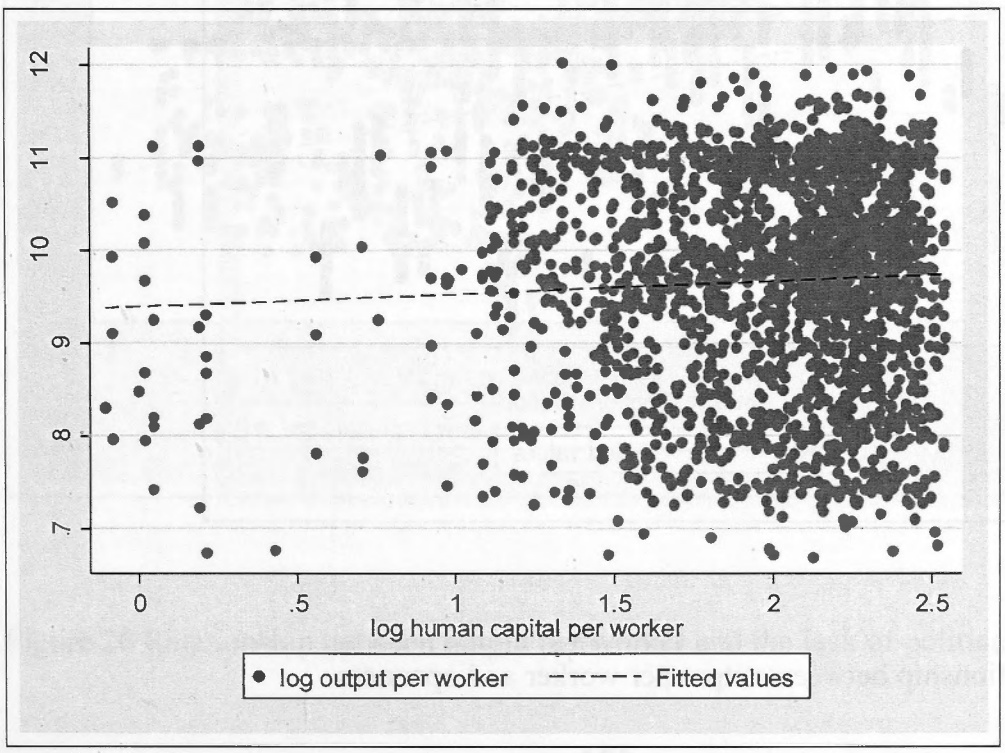


Figure 22 Relationship between output per worker and latitude

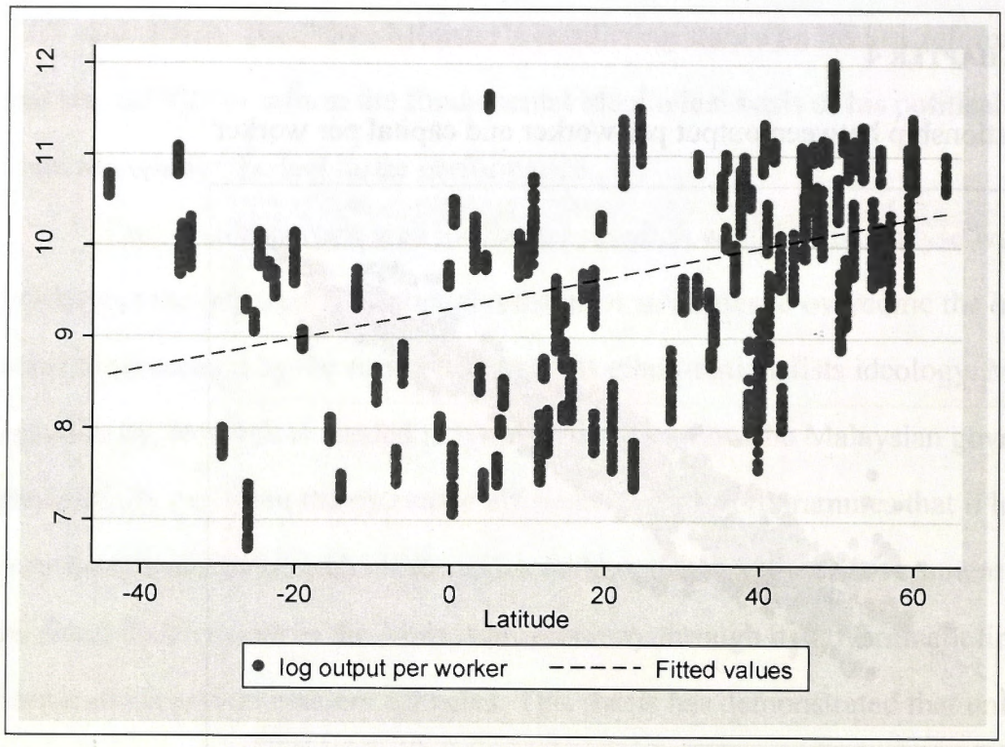


Figure 23 Relationship between output per worker and ethno linguistic fractionalisation

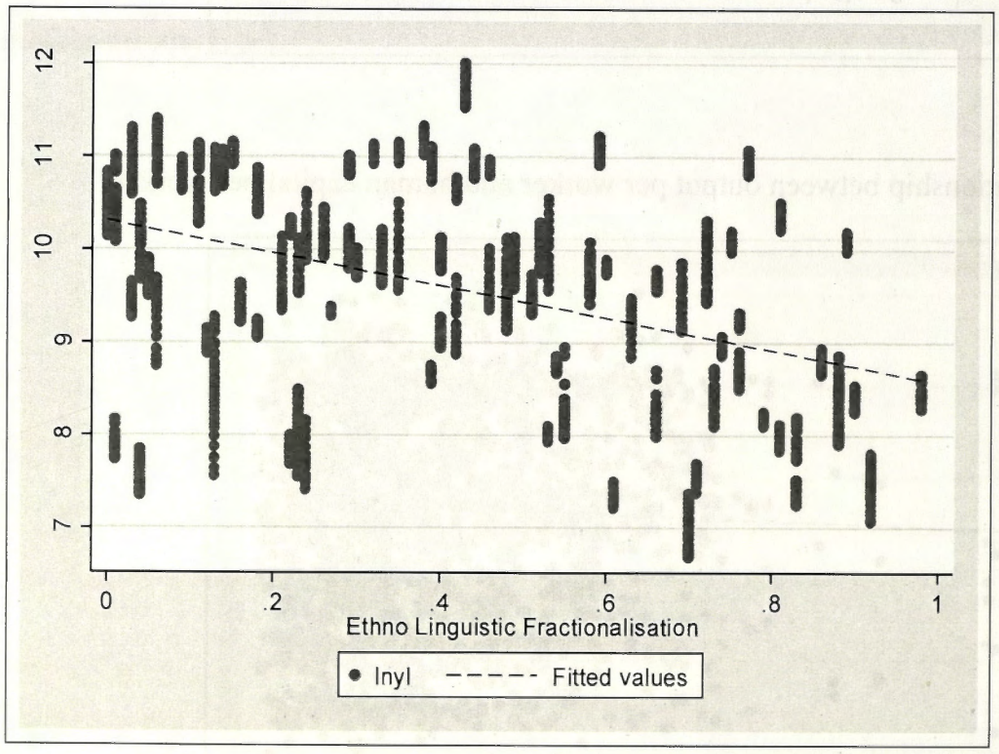


Figure 24 Relationship between output per worker and openness

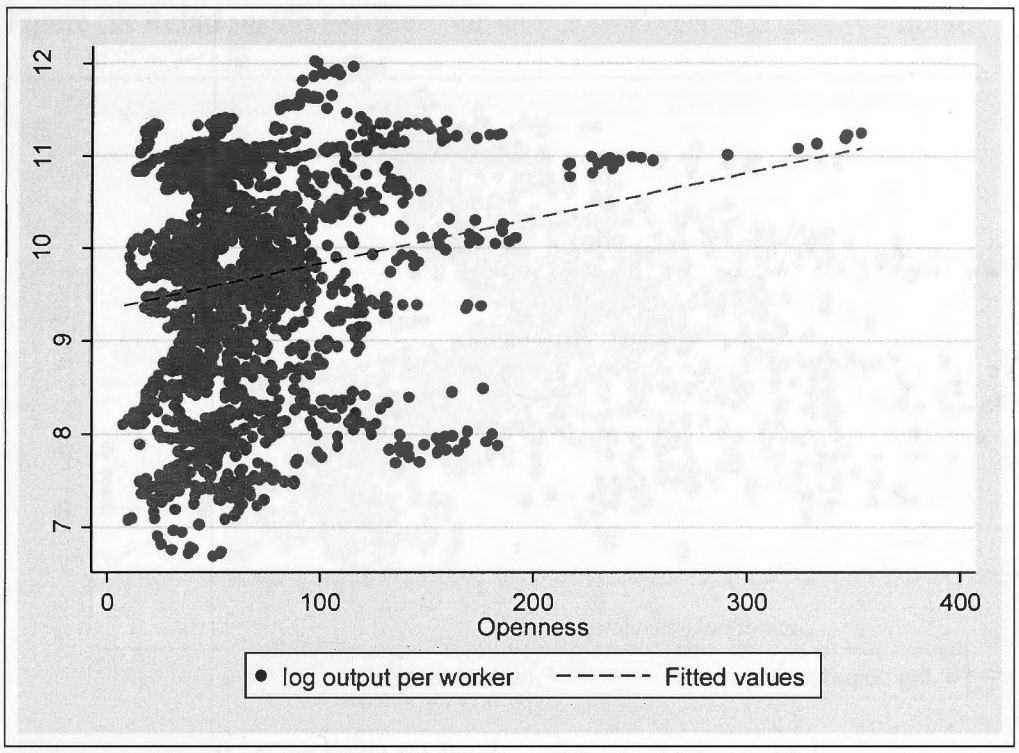


Figure 25 Relationship between out per worker and voice and accountability

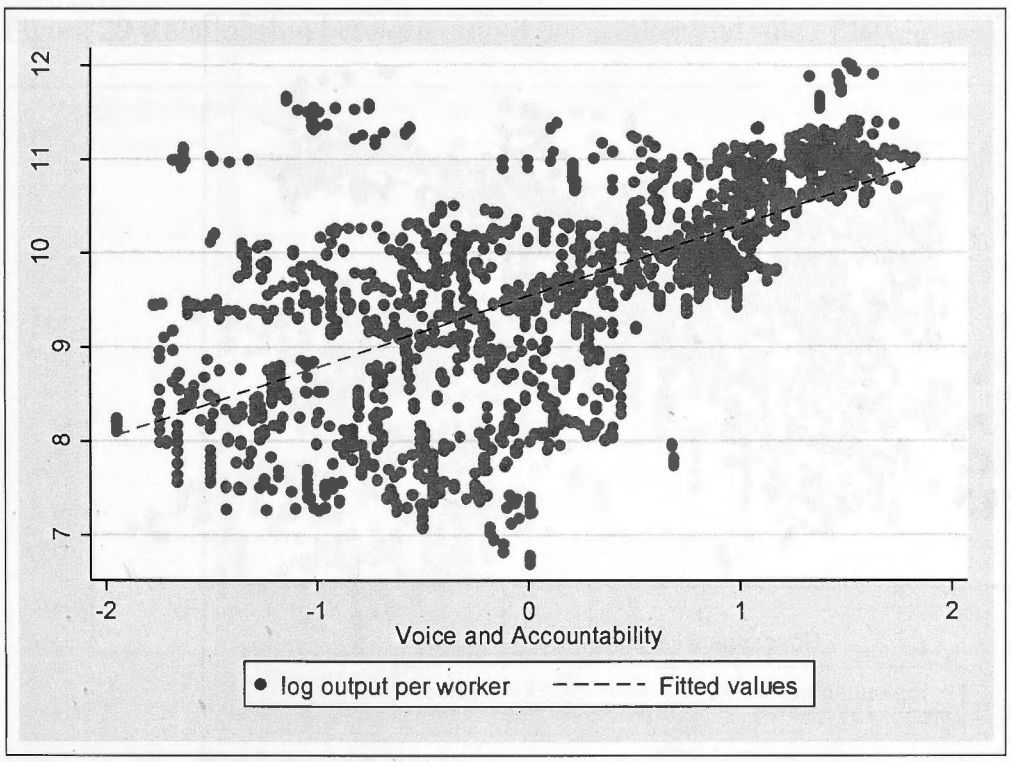


Figure 26 Relationship between output per worker and the lack of political violence

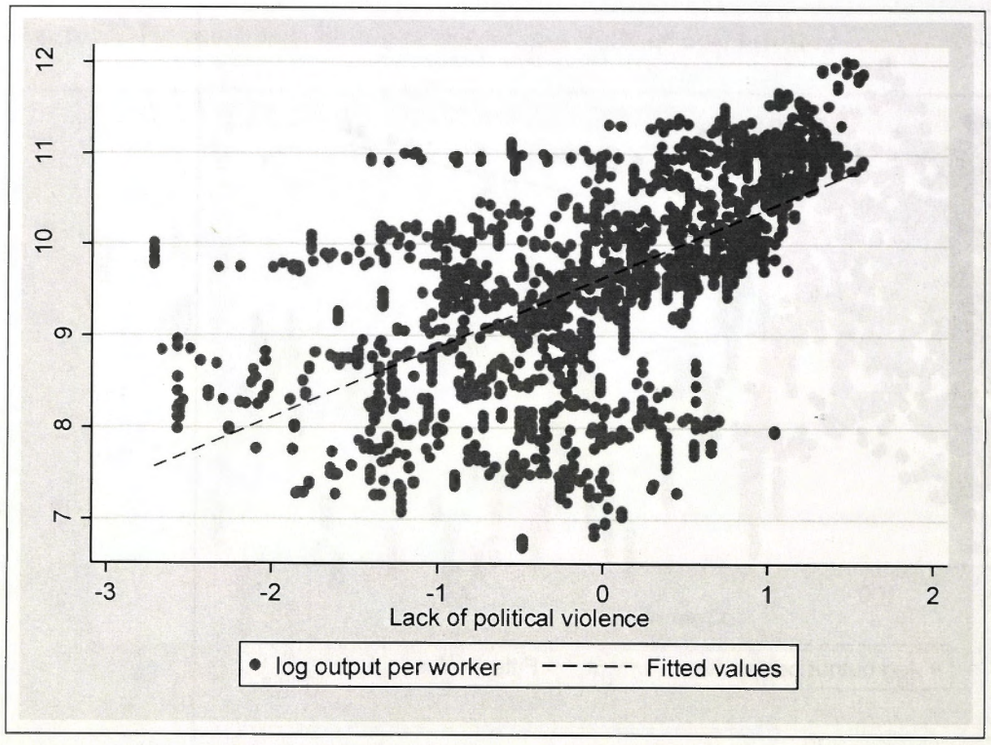


Figure 27 Relationship between output per worker and government effectiveness

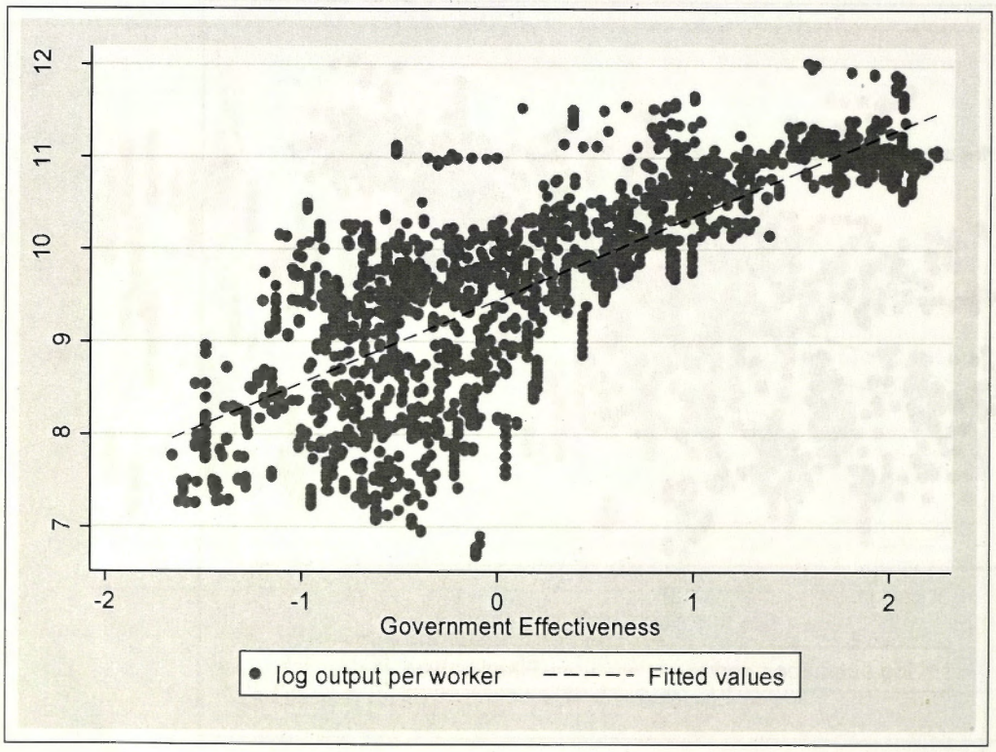


Figure 28 Relationship between output per worker and regulatory quality

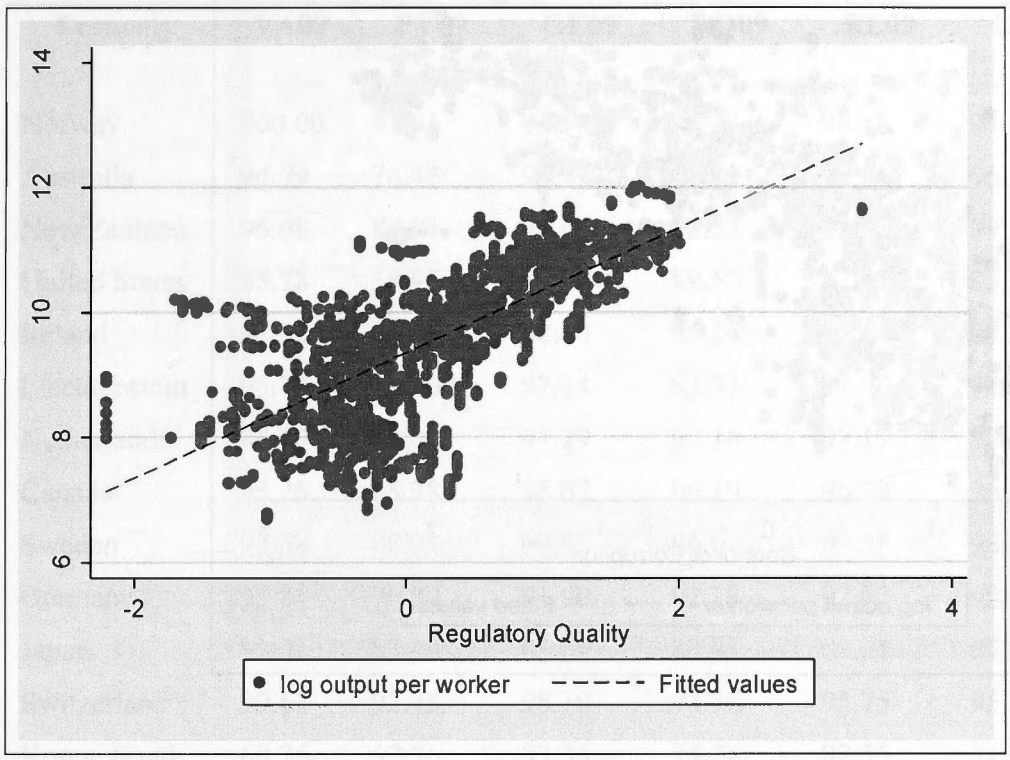


Figure 29 Relationship between output per worker and rule of law

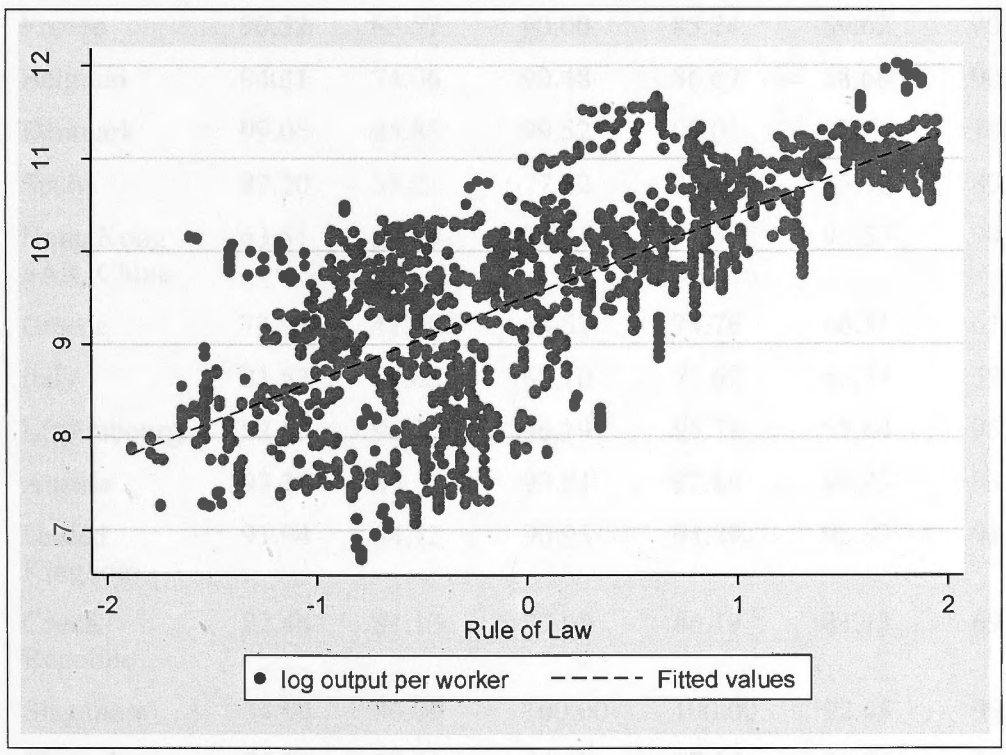


Figure 30 Relationship between output per worker and the control of corruption

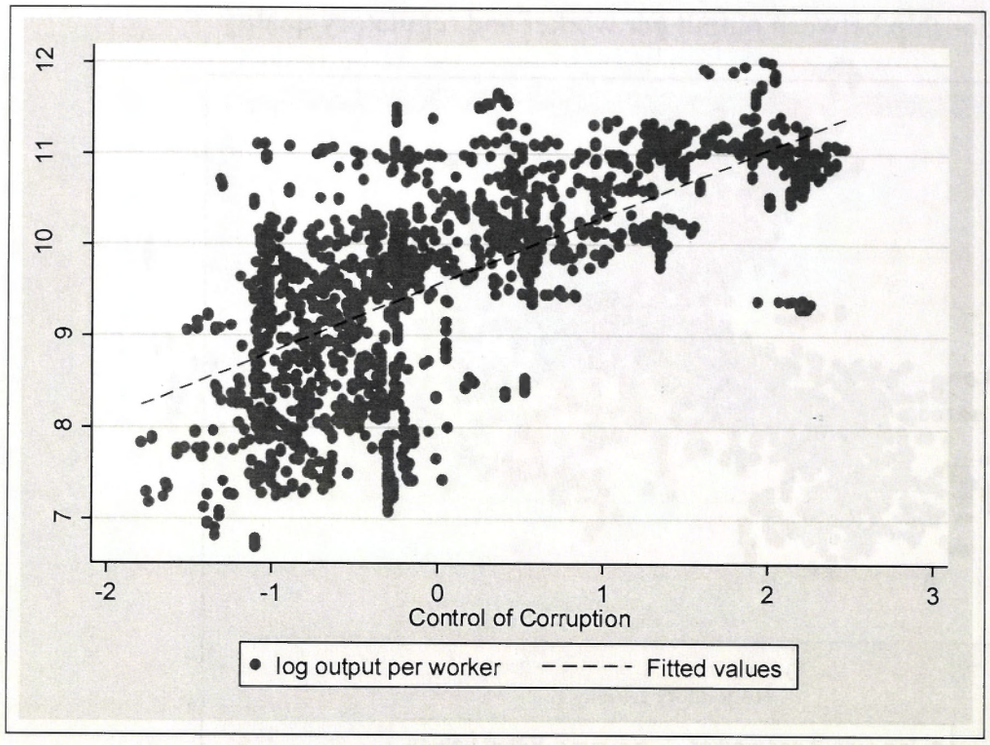

12
11
10
9
8
7
-2
-1
0
1
2
3
Control of Corruption
log output per worker
Fitted values

Table 52 Governance indicators and welfare outcomes

Economy	VA09	PV09	GE09	RQ09	RL09	CC09	HDI value
Norway	100.00	91.51	94.76	91.43	98.58	94.76	93.70
Australia	94.79	76.42	95.24	98.10	95.28	96.19	93.50
New Zealand	96.68	84.91	97.62	98.57	99.06	99.52	90.40
United States	85.78	58.96	89.05	89.52	91.51	85.24	89.90
Ireland	92.42	84.43	88.10	95.24	94.34	93.33	89.40
Liechtenstein	95.73	100.00	97.14	93.33	91.98	92.38	88.90
Netherlands	98.10	83.02	94.29	97.14	97.17	97.62	88.80
Canada	95.26	85.38	96.67	96.19	96.70	96.67	88.60
Sweden	98.58	88.21	98.57	96.67	99.53	98.57	88.40
Germany	93.84	76.89	91.90	92.38	92.92	92.86	88.30
Japan	81.04	83.49	86.67	80.95	88.21	87.14	88.10
Switzerland	99.53	92.45	98.10	94.76	95.75	95.71	87.20
Korea, South	68.25	52.36	83.33	75.24	82.55	71.43	87.20
Israel	67.30	9.43	82.38	81.43	74.53	74.76	87.10
Finland	97.16	95.75	99.05	97.62	100.00	98.10	86.90
Iceland	96.21	91.98	93.33	79.05	94.81	97.14	86.90
France	90.52	65.57	90.00	85.24	89.62	90.48	86.90
Belgium	94.31	74.06	90.48	86.67	88.68	90.95	86.50
Denmark	99.05	85.85	99.52	99.05	98.11	100.00	86.40
Spain	87.20	38.21	77.62	84.76	85.38	80.48	86.10
Hong Kong SAR, China	63.51	81.60	95.71	99.52	90.57	94.29	85.70
Greece	73.93	41.98	68.57	74.76	66.51	61.43	85.30
Italy	81.52	64.62	68.10	77.62	62.74	59.05	85.10
Luxembourg	97.63	96.23	96.19	95.71	97.64	95.24	85.00
Austria	93.36	89.15	93.81	92.86	96.23	93.81	84.90
United Kingdom	91.94	54.72	90.95	94.29	93.87	91.43	84.70
Czech Republic	82.46	81.13	79.05	86.19	81.13	69.52	84.10
Singapore	34.60	90.09	100.00	100.00	92.45	99.05	84.10
Slovenia	76.30	77.36	84.29	77.14	83.96	81.43	82.60
Andorra	92.89	94.81	92.86	90.95	87.26	89.05	82.20
Slovakia	72.51	78.77	76.67	82.38	67.92	66.19	81.50

Economy	VA09	PV09	GE09	RQ09	RL09	CC09	HDI value
Malta	88.63	86.32	82.86	89.05	91.04	78.57	81.30
United Arab Emirates	24.17	80.66	77.14	68.57	64.62	80.95	81.20
Estonia	85.31	66.98	84.76	91.90	84.91	80.00	80.90
Cyprus	82.94	57.55	88.57	87.62	85.85	79.52	80.90
Brunei	27.49	95.28	75.24	82.86	72.17	79.05	80.40
Hungary	79.62	67.92	73.81	81.90	73.58	70.00	80.30
Bahrain	25.59	40.57	69.05	74.29	64.15	65.24	79.80
Qatar	23.22	88.68	83.81	70.95	80.66	91.90	79.80
Portugal	89.10	74.53	85.24	80.48	83.49	81.90	79.10
Poland	80.09	80.19	70.95	78.57	68.87	70.95	79.10
Barbados	86.73	87.74	91.43	65.24	81.60	86.67	78.70
Bahamas	77.25	77.83	80.95	73.81	72.64	90.00	78.30
Latvia	70.14	61.32	69.52	80.00	74.06	65.71	76.90
Kuwait	30.81	59.43	61.43	55.71	66.04	69.05	76.90
Croatia	64.93	67.45	70.48	68.10	60.38	58.57	76.50
Saudi Arabia	3.79	32.55	51.90	56.67	58.49	62.86	74.80
Malaysia	31.28	46.70	79.52	60.00	65.09	58.10	73.90
Trinidad And Tobago	61.14	44.81	64.29	69.52	49.06	55.71	73.20
Equatorial Guinea	3.32	42.92	2.86	6.67	8.02	0.95	53.60
Oman	16.11	75.47	71.43	73.33	69.34	70.48	n/a

Source World Governance Indicators, (2012).

APPENDIX 2 CHAPTER 5

The Malaysian Productivity and Investment Climate Surveys (PICS-I and PICS-II)

The Malaysia Productivity and Investment Climate Survey (PICS – I) is based on a stratified random survey of 1,151 firms conducted by the Malaysian Department of Statistics and the Economic Planning Unit from December 2002 to May 2003 in collaboration with the World Bank. The objective of the survey was to identify the key constraints to competitiveness as perceived by the firms in the manufacturing and selected business support services. It covered 10 industries in the manufacturing sector and five industries in the business support services sector across six regions in Malaysia. A total of 902 firms in the manufacturing sector and 249 firms in selected business support services were surveyed. The firms were probed on three areas: the firms' perceptions of what was holding back productivity growth; to assess the skills and technology programs in Malaysia; and to assess the investment climate.

The second Malaysia Productivity and Investment Climate Survey (PICS – II) was undertaken in 2007 to assess whether and how the investment environment had changed since the first survey in 2002 (PICS-I). PICS – II added two new industries in the manufacturing sector to the survey, making it 12 industries surveyed and retained the five in the business support services sector. PICS-II surveyed 1115 firms in the manufacturing sector and 303 in selected business support services. 488 manufacturing firms and 137 services firms participated in both survey rounds.

World Bank, (2005; 2009)

Technology indicators

The Technology Achievement Index (TAI) is a composite indicator which aggregates national technological capabilities and performance in terms of creation/diffusion of new technologies, diffusion of old technologies and development of human skills.

The Knowledge Assessment Methodology (KAM) consists of 109 structural and qualitative variables on the 4 Knowledge Economy pillars: (i) economic incentive and institutional regime; (ii) education and skills; (iii), innovation; and (iv) information and communications technology infrastructure. Variables are normalised on a scale of 0 to 10 relative to other countries in the comparison group. The KAM also derives a country's overall Knowledge Economy Index (KEI) and Knowledge Index (KI). The variable of interests which is used in this paper is education and skills.

Classification of workers

The 2000-2005 data classifies workers as: (i) managerial and professional; technical and supervisory; clerical and related occupation: general workers; production/operative workers directly employed; production/operative workers employed through labour contractors.

In this study, workers are classified in the following manner:

(i) Skilled – managerial and professional; technical and supervisory;

(ii) Semi-skilled – clerical and related occupations; production/operative workers directly employed; production/operative workers employed through labour contractors;

(iii) Unskilled workers – general workers.

Figure 31 Technical efficiency and local establishments' for industries in the manufacturing sector, 2000-2005

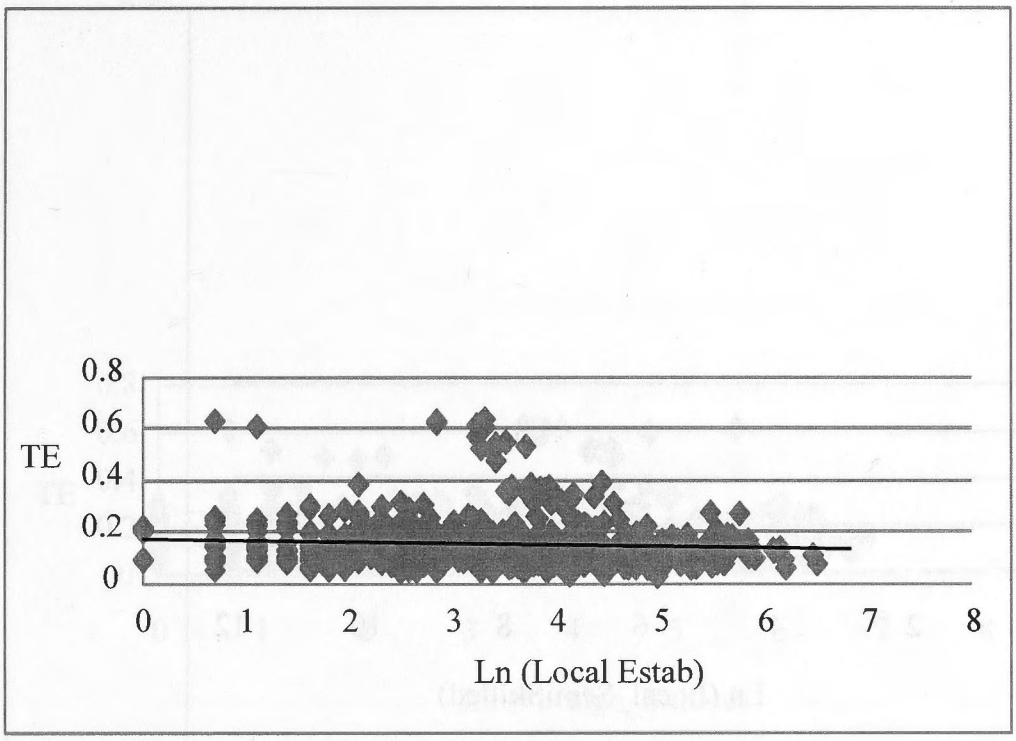


Figure 32 Technical efficiency and local skilled workers for industries in the Malaysian manufacturing sector, 2000-2005

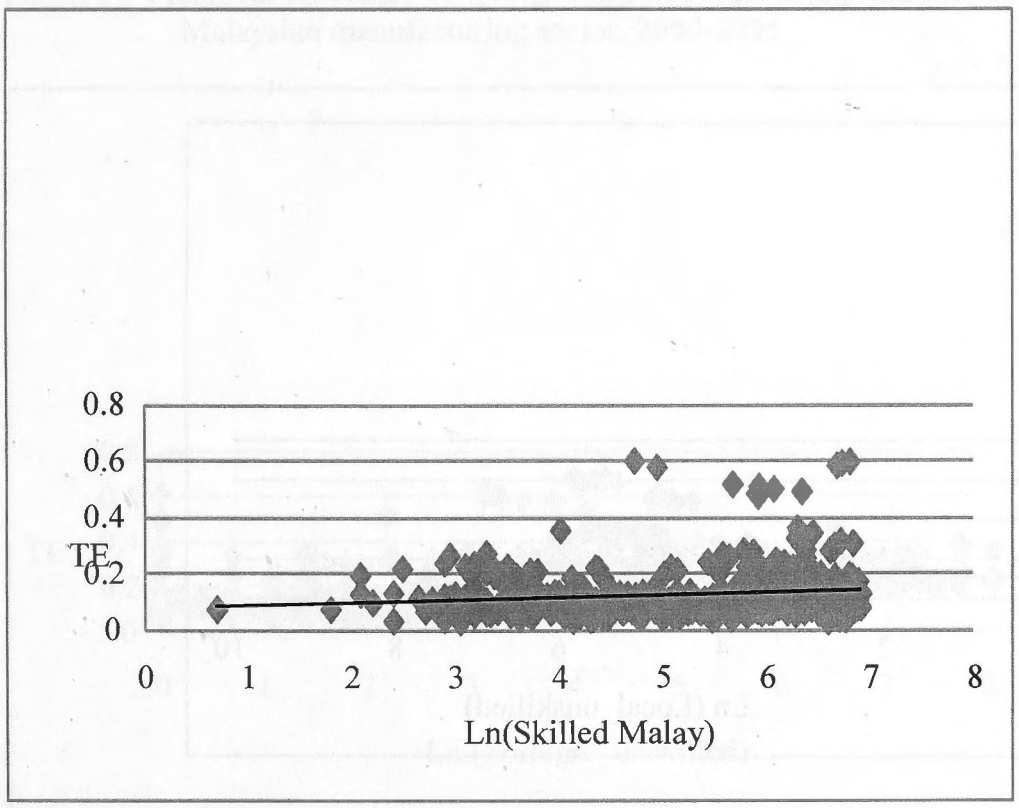


Figure 33 Technical efficiency of local semi-skilled workers for industries in the Malaysian manufacturing sector

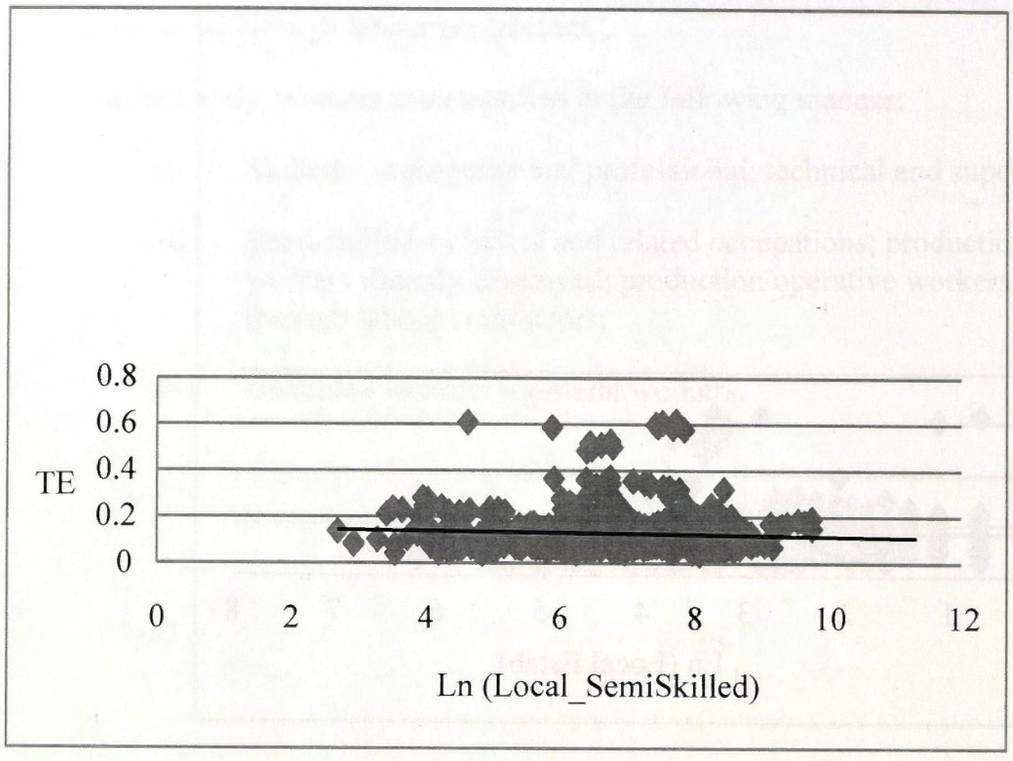


Figure 34 Technical efficiency of local unskilled workers for industries in the Malaysian manufacturing sector, 2000-2005

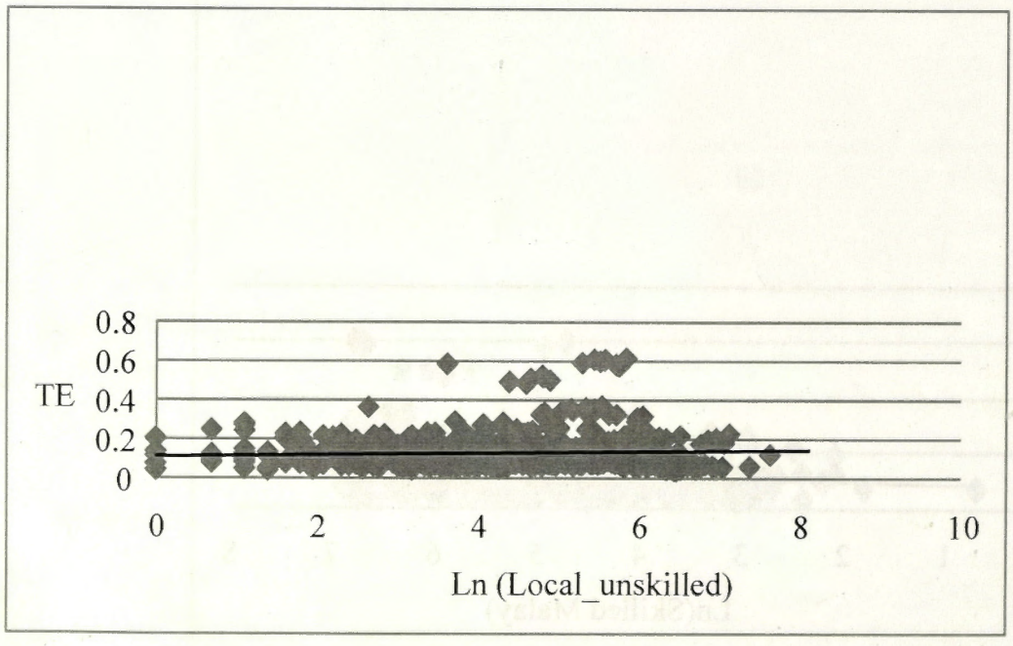


Figure 35 Technical efficiency of foreign skilled workers for industries in the Malaysian manufacturing sector

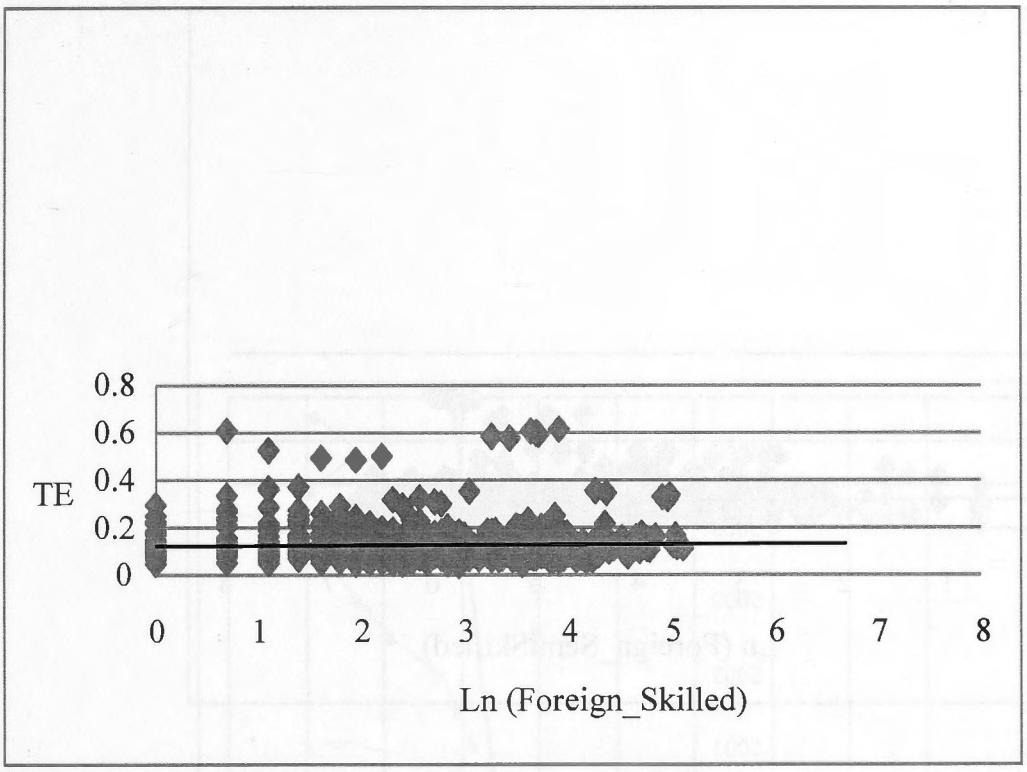


Figure 36 Technical efficiency of foreign unskilled workers for industries in the Malaysian manufacturing sector, 2000-2005

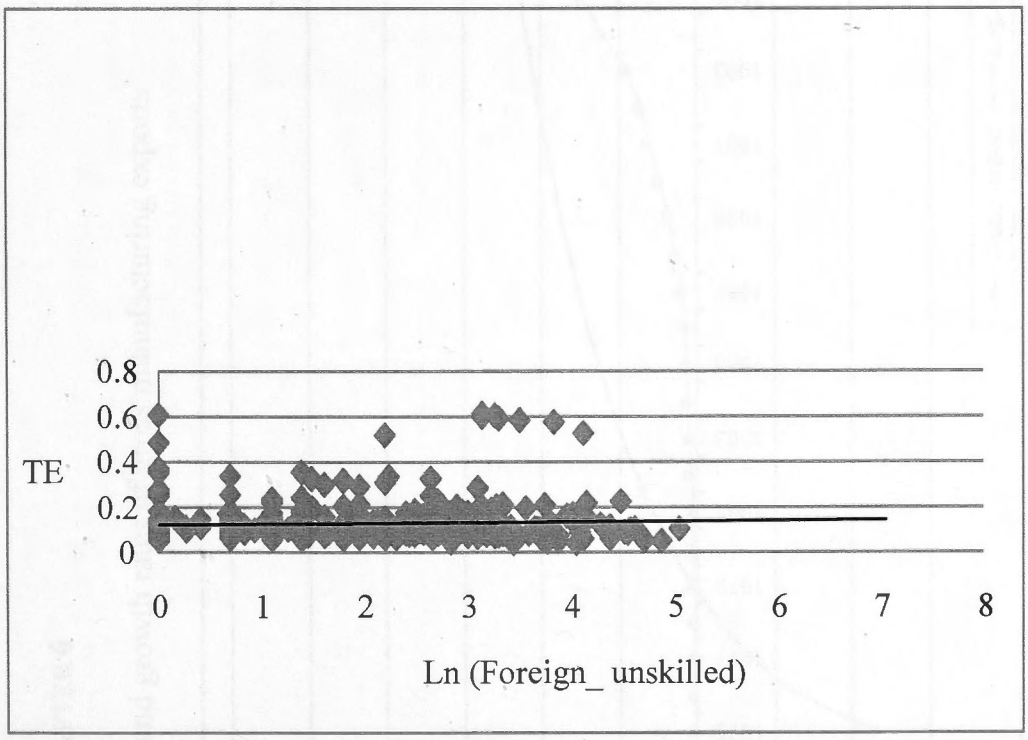
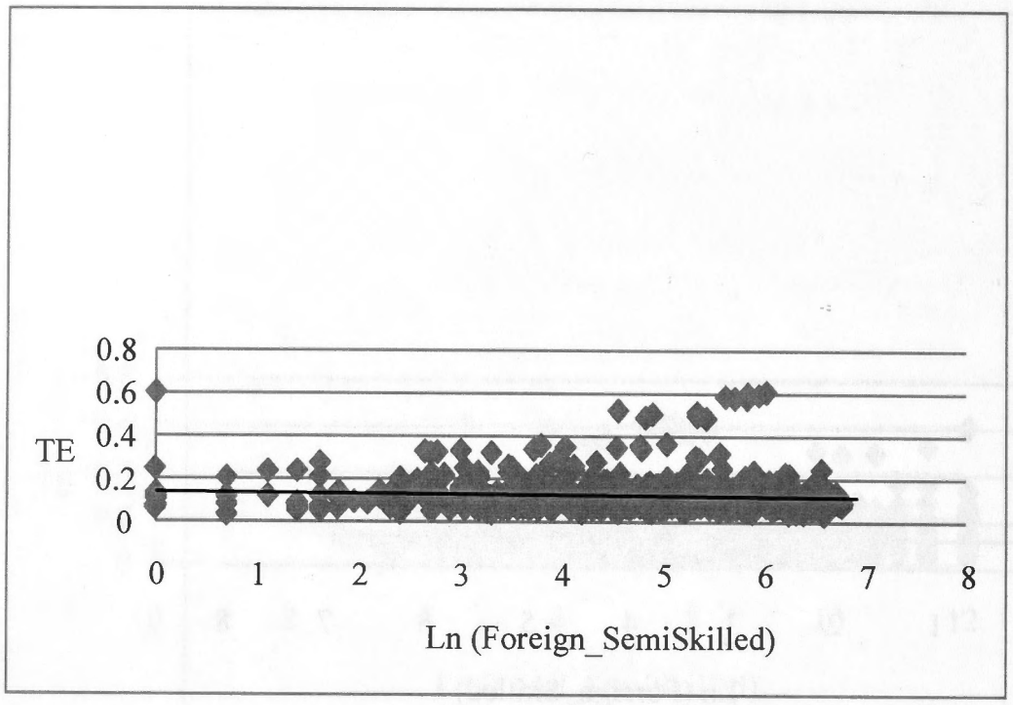
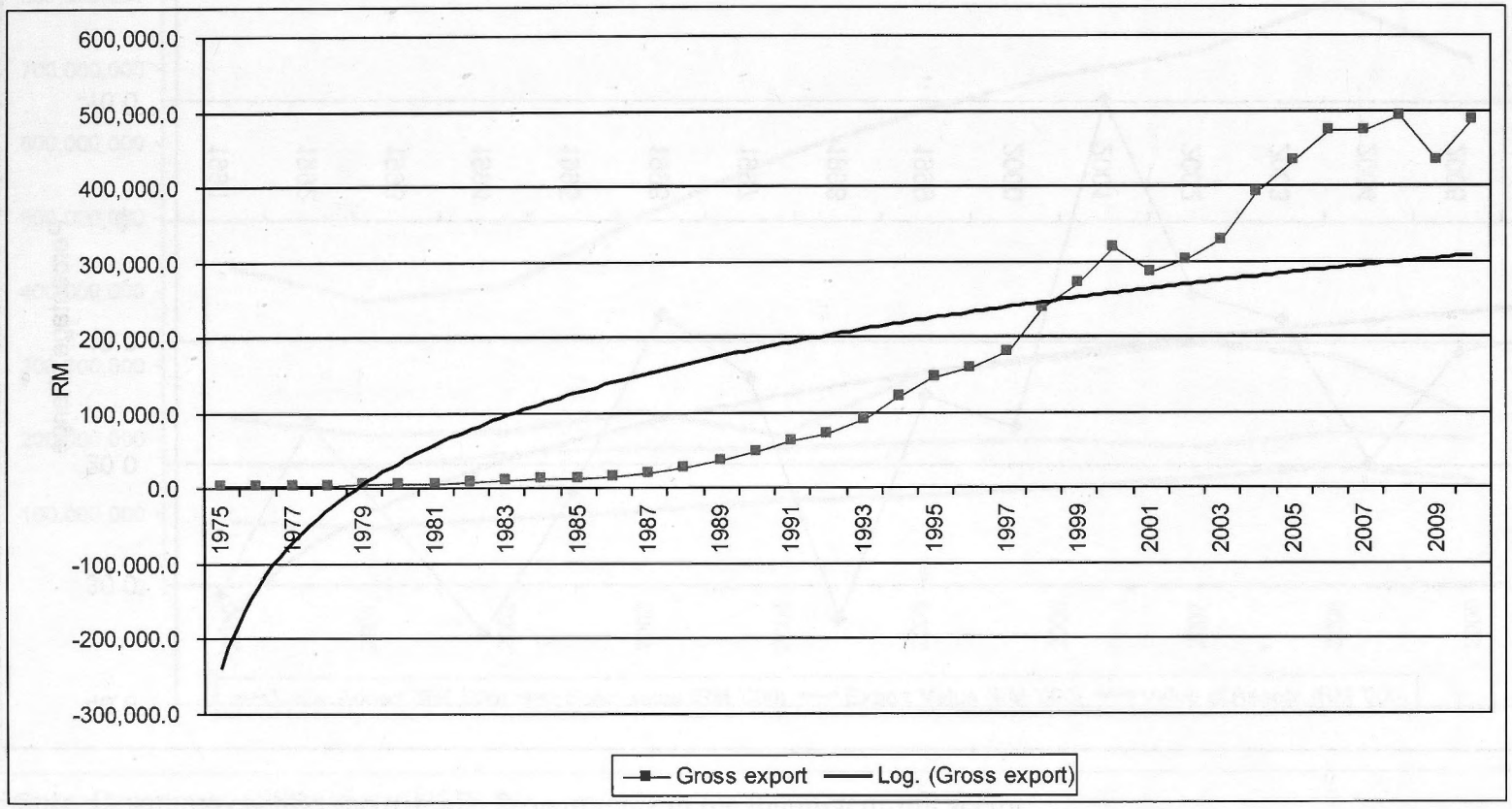


Figure 37 Technical efficiency of foreign semi-skilled workers for industries in the Malaysia's manufacturing sector, 2000-2005



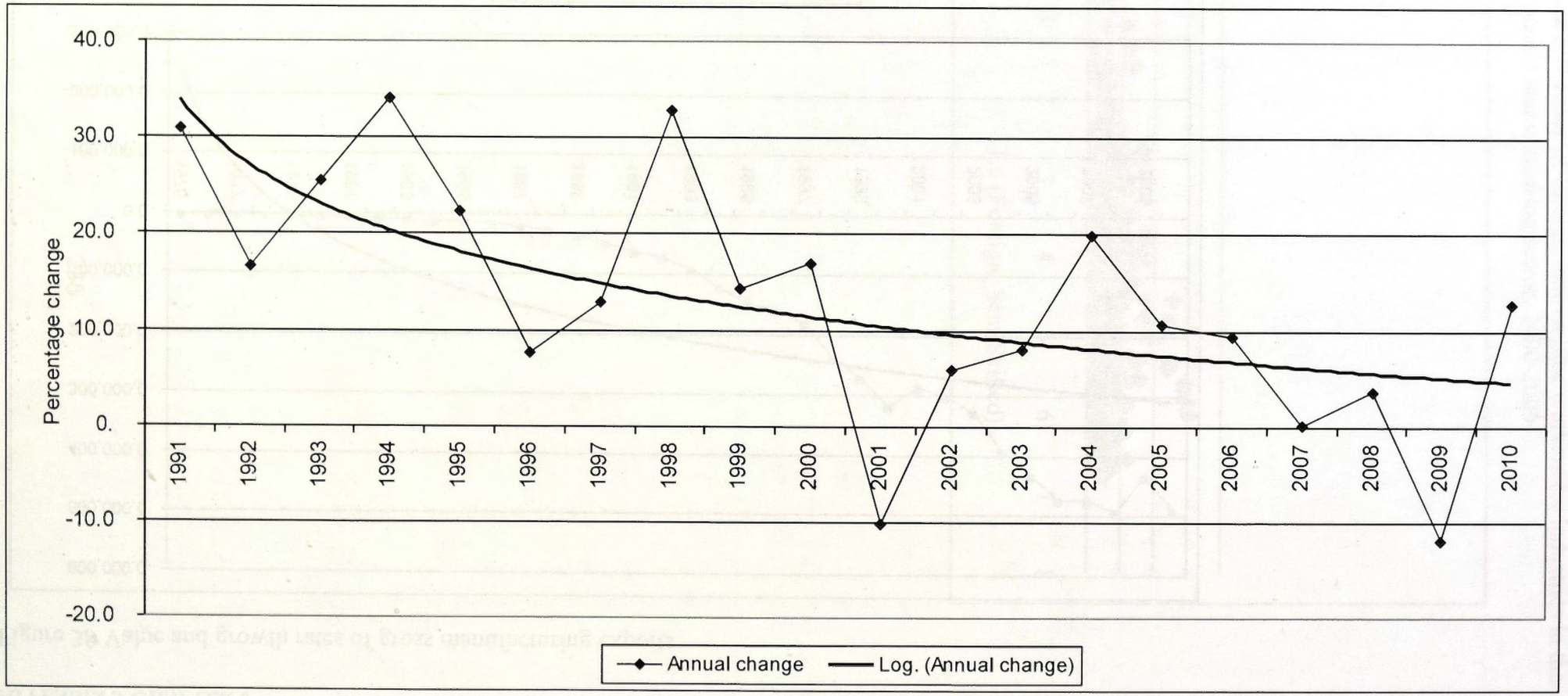
APPENDIX 3 CHAPTER 6

Figure 38 Value and growth rates of gross manufacturing exports



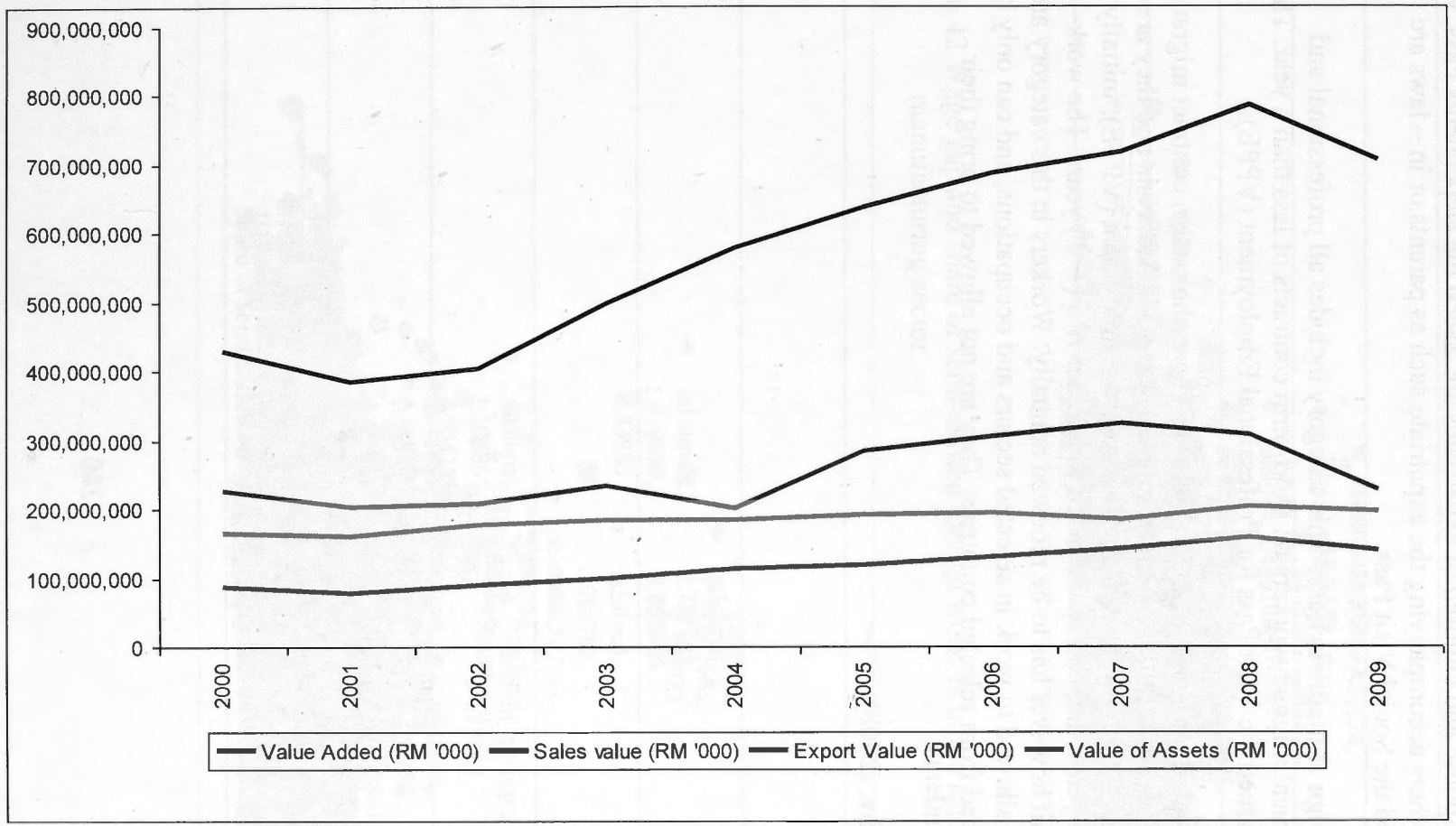
Source: Department of Statistics, (2011)

Figure 39 Annual change and average growth rates in the manufacturing sector



Source: Department of Statistics, (2011).

Figure 40 Total value-added, export value, sales and value of assets in the manufacturing sector



Source: Department of Statistics, (2011).

Box 2 Classification of foreign labour in Malaysia

The Department of Immigration gathers data on international migrants to Malaysia based on the type of visa or work permit issued to foreigners. Data on the following categories are generated by the Department of Immigration

- **Expatriates:** This group includes all professional and technical migrant workers who earn a monthly salary of not less than RM3, 000. The expatriates are issued with an Employment Pass if the employment contract is at least two years. Expatriates are allowed to bring in their dependents. The spouse and children of expatriates are issued the Dependents Pass, while the others accompanying the expatriate such as parents or in – laws are issued the Social Visit Pass.

- **Foreign skilled workers:** This category includes all professional and technical migrant workers on short-term contracts of less than a year. They are issued the Visit Pass for Professional Employment (VPPE).

- **Unskilled and semi-skilled workers:** These short-term contract migrant workers are commonly termed migrant worker in Malaysia and they are issued with the Visit Pass for Temporary Employment (VPTE), initially for three years, and can be extended to another two (1+1) years. The work permit however has to be renewed annually. Workers in this category are only allowed to work in selected sectors and occupations, and can only be sourced from selected countries. They are not allowed to bring their dependents.

Kanapathy, (2008).

Figure 41 Wage gap and share of skilled foreign workers in the Malaysian manufacturing sector

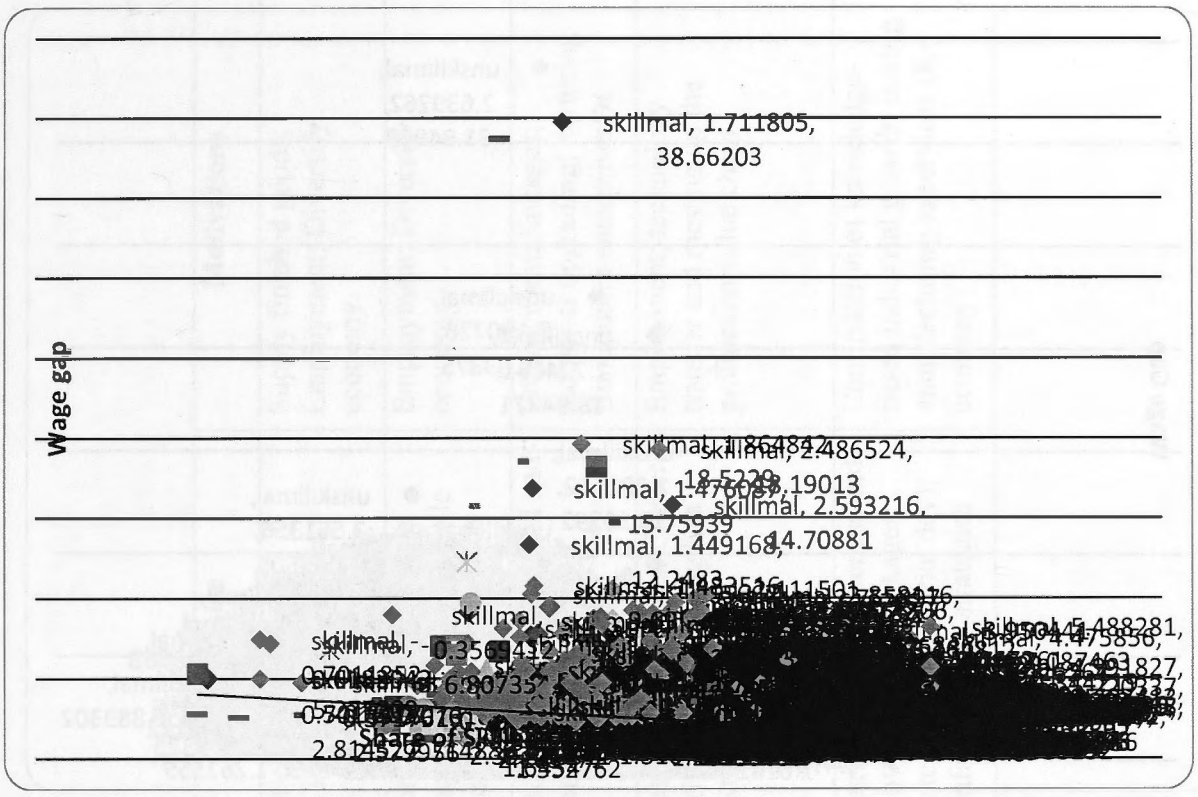


Figure 42 Wage gap and share of semi-skilled foreign workers in the Malaysian manufacturing sector

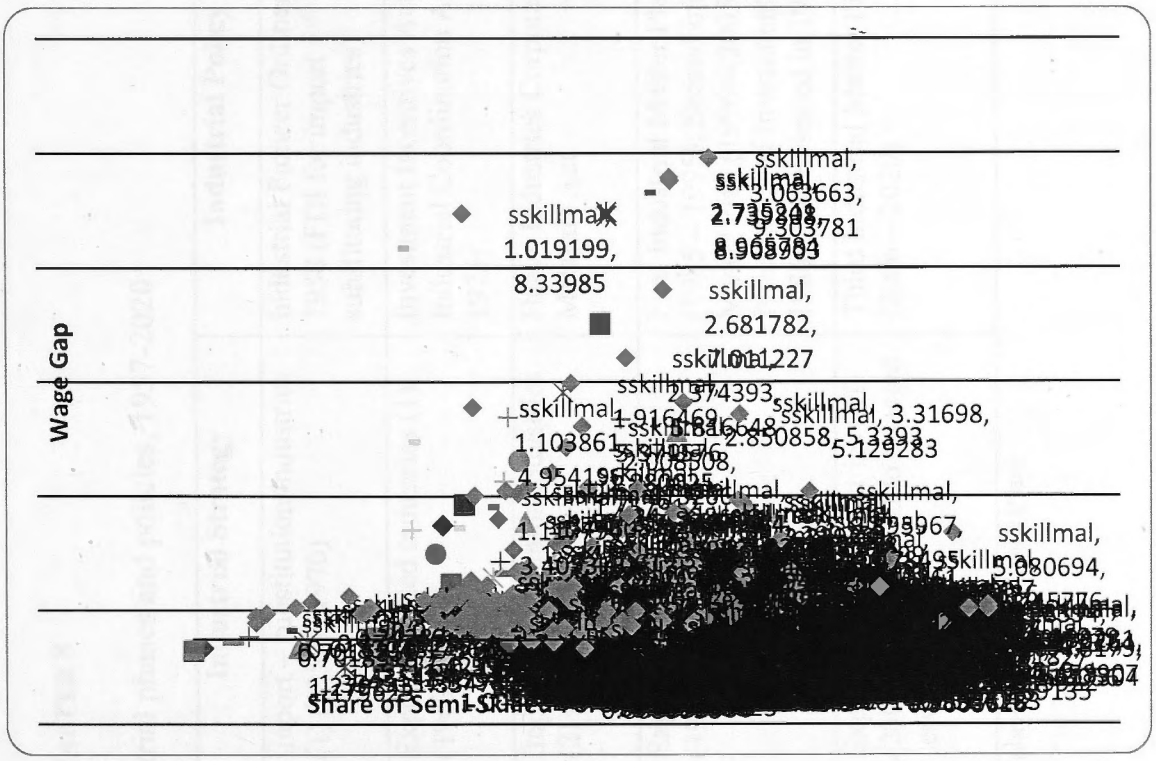
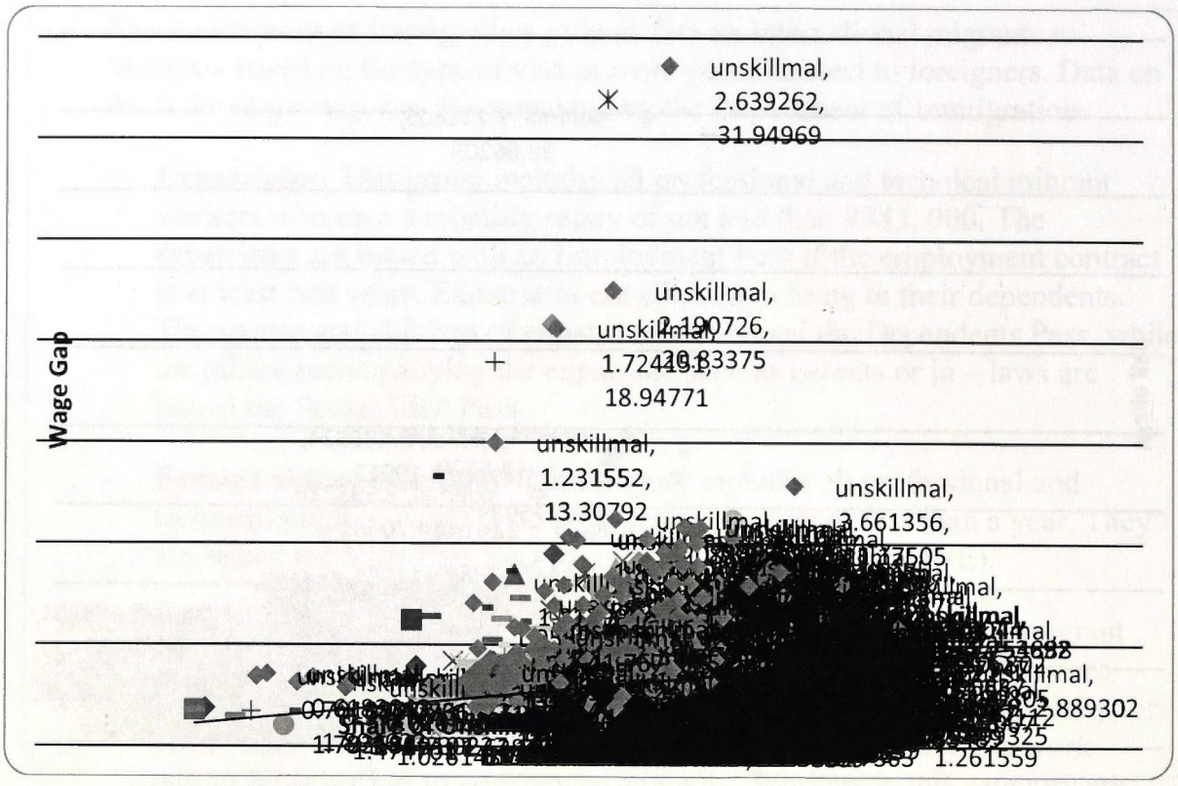


Figure 43 Wage gap and share of unskilled foreign workers in the Malaysian manufacturing sector



APPENDIX 4 CHAPTER 8

Table 53 Industrial phases and policies, 1957-2020

Phase	Industrial Strategy	Industrial Policy	Emphasise	Motivations
I	Import – substitution industries (1) (1956 – 1970)	Industrial Pioneer Ordinance 1958 (FDI for import substituting industries)	Light consumer goods; Domestic market-oriented	Supply finished goods; Employment; Diversify economy.
II	Export Oriented Industries (1) (1969 – 1980)	Investment Incentives Act 1968; Industrial Coordination Act 1975;	Export oriented; Free trade zones; Electronics and textile products;	Employment; Diversify economy
III	Import – substitution industries (2) (1980 – 85)	Heavy Industries Corporation of Malaysia Act	Consumer durables; Capital and intermediate goods	Employment; linkages; industrial upgrading; nurturing Bumiputera enterprises;
IV	Export – oriented industries (1986 – 2005)	First Industrial Master Plan (1985 – 1995); Second industrial Master Plan (1996 – 2005) Promotions of Investment Act 1986. PIA reviewed in 1991.	Access to new markets; Cluster based industries; Strengthen industrial linkages	Employment; technology transfer and moving up the production value chain
V	Export-oriented industries (III) (2006 – 2020) linked to selected services sector	Third Industrial Master Plan (2006 – 2020)	Strengthen competitiveness and improve industrial linkages; (Cluster based industrial dev); Manufacturing ++ strategies	Continuation of knowledge-based industrial growth; linking manufacturing to services (K-economy)

Source: Various Malaysia Plans, Master Plans

Table 54 Evolution of Malaysia's economic development, human capital development, science and technology and industrial policies

	1960s	1970s	1980s	1990s	2000s	2010
Development stage and key sectors	Primary commodities, agriculture; provision of basic infrastructure		Investment driven stage, shift to manufacturing; focus on learning and developing duplicative imitation and adaptive capabilities		Innovation driven stage?? - Focused towards knowledge based/ innovation economy	
Economic planning and conditions	Laissez-faire; Malaysia Plan; rise in public expenditure	New Economic Policy – focus on national unity and restructuring society	Large investments in heavy industries; growth in FDI; major recession	Vision 2020 ; APITD; East Asian Economic Crisis	NEAC; National Innovation Model; focus on sustainable growth	New Economic Model; 10th Malaysia Plan; Global Financial Crisis
Industrial policy direction	Dependence on primary commodities; decline of commodity prices; Beginning of import substitution	Free Trade Zones and beginning of Export led industrialisation	Liberalisation of private sector investment; shift towards heavy industries; Industrial Master plan I	Growth strategies focusing on modernisation of technology (e.g. high technology, ICT); Industrial Master plan II;	Focus on productivity driven growth; Stimulating knowledge based indigenous innovation; Industrial Master plan III; Knowledge-based	Greater emphasis on knowledge based economic growth??

	1960s	1970s	1980s	1990s	2000s	2010
					Economy Master plan.	
S&T policies	Limited to agriculture	Dedicated Ministry for Science; setting up of NCSRD	1st National S&T policy; first chapter on S&T in Malaysia plans; IRPA grants established; double deduction incentives for R&D	Multimedia Super Corridor established; National IT Council; restart of meg-projects; Returning Scientist Programme	2nd National S&T policy; National Innovation Council; Biotech strategy announced; IRPAs streamlined; Brain Gain programme launched	Year of Innovation; Talent Corporation established; UNIK; PEMANDU
Education policy	Focus on basic education for all	Focus on improving quality; system begins adjusting to economic needs	Continued focus on improving quality and access; National Vocational Training Council.	Large scale economic reform; Reforms in private sector institutions; Human Resource Development Fund.	Ministry of Higher Education established; National Higher Education Action Plan; creation of research universities; Apex universities; Grading system; Implementation of MQF, NDTS.	Reforms in schools – learning from top schools worldwide

Note: NCSRD – National Council for Scientific Research and Development; APITD – Action Plan for Industrial Technology Development; IRPA – Intensification of Research in Priority Areas; NEAC – National Economic Action Council; UNIK – Unit Inovasi Khas/Special Innovations Unit; MQF – Malaysian Qualification Framework; NDTS – National Dual Training System

Table 55 Strategic reforms in the ETP

Strategic Reform Initiatives (SRI)	Key outcomes
International standards and liberalisation	Follow international standards in governance, management and sustainability Adopt quality standards for goods and services Convert existing Malaysian standards into international standards Administer compliance with standards Liberalisation of entry, ownership and operations Reform the regulatory framework Swift and resolute implementation of the competition law
Government's role in business	Set-up central oversight authority Divest non-strategic companies and re-engineer the roles of the remaining ones Channel proceeds from divestment into a sovereign wealth fund Reengineer GLCs to support private sector Consolidate and merge national enterprises to create scale.
Human capital development	Modernise labour legislation Strengthen strategic human resource programmes Establish a national wage consultative council Formalise a productivity linked wage system Consider a minimum wage policy Enhance the labour safety net by introducing unemployment insurance Undertake a labour market forecast and survey programme Focus on up-skilling and upgrading of workforce Leveraging women's talent to raise productivity
Public service delivery	Revise the public sector governance framework Implement a compliance monitoring system Strengthen the government's facilitative role Create a citizen-centred public service Expand private delivery of public service Enhance public agencies to drive growth Reform the PSC (JPA) to define strategic human resource policy and management process in the public sector Revive the NDPC as the premier body for policy development, coordination and consultation

Strategic Reform Initiatives (SRI)	Key outcomes
Narrowing disparities (Bumiputera SMEs)	Establish specific programmes for Bumiputera SMEs. Focus on capacity building programmes
Public finance reforms	Develop government and GLC procurement policies that support local innovative products and services Adopt accrual accounting for prudent fiscal management Implement efficient broad based tax (GST) for revenue and fiscal stability Strengthen expenditure control Improve fiscal policy institutions and processes
Natural homes (NKEAs / NKRAs/ National Committee of Investments/UNIK)	Supporting SMEs and innovation and efficiency in allocation of capital Accelerate the rollout of broadband Internalise externalities Promote green growth and energy efficiency Favour sustainable agriculture Strive for energy resources sustainability Foster better and closer R&D links between institutions of higher learning (IHLs) and the private sector Turning existing HiCoEs (Centre of Excellence Accredited by the MoHE into full-fledged networks of excellence) Extract greater value from the development and management of Intellectual Property Pursue administrative reforms in the Judiciary Establish an overarching policy on social assistance programme Adopt a single comprehensive database based initially on e-Kasih Addressing the transportation and housing needs Break the poverty cycle through education

Source: PEMANDU, (2012).

Table 56 Strategic Reform Initiative – Human Capital Development

Workplace transformation	Workforce transformation
Level 1: [Rule] Modernise labour legislations	Ensure reduced cost of labour management to business Ensure effective worker protection
Level 4: [Organisation] Strengthen human resources management in SMEs	Identify centres/organisations that can provide HR management support for SMEs to enhance quality and productivity Provide incentives to SMEs that adopt specific HR practises consistent with international standards
Level 2: [Labour market] Enhance the labour safety net by introducing unemployment insurance	Unemployment insurance scheme supported by up-skilling and retraining programme and upgraded employment services.
Level 5: [sectoral performance] Focus on up-skilling and up-grading the workforce	Strengthen logistical links between industry needs and outputs of training / vocational / tertiary entities to improve training relevance Involve industry in curriculum development and teaching
Level 5: [sectoral performance] Undertake a labour market forecast and survey programme	A framework to establish a centralised labour market institute to be defined and adopted.
Level 5: [sectoral performance] leverage women's talents to raise productivity	Adopt policies to leverage women's talents to raise productivity Promote participation of women in public and private sector

Source: PEMANDU, (2012).

Table 57 Improving student outcomes (educational sector reforms under GTP)

Institutional level	Institutional reforms
Level 1: norms; rules; conventions; habits and values	Status quo remains. No commitment to meritocracy (Attracting the best students and retaining the best teachers. Performance based evaluation can only be implemented if government reverses current ethno-supremacist ideology.)
Level 2: markets; states; corporate hierarchies; communities	Market intervention and market regulation
Level 3: system of education	Increasing public-private partnership – to achieve additional classes while adhering to national standards.
Level 4: Organisations	Developing high performing schools Identifying and rewarding high performing schools: schools which excel in all aspects of education and maintain its decorum will be rewarded with more freedom in decision making, financial incentives, human resource flexibility and chances for student advancement. Performance management: Schools rated based on a composite score which consists of the Grade Point Average (70%) and Standard for Quality Education in Malaysia (SQEM) (30%) School performance ranking: Performance of 9,900 government schools will be ranked on a yearly basis. Target to reduce the number of Band 6 and 7 schools (lowest) by 20% and increase the number of Band 1 and 2 schools by 7% in the course of the GTP. New Deal: Head teachers and principals reward system: Those who exceed targets set will be given both financial and non-financial rewards. Underperformers will be sent to undergo development management and remedial programmes to assist their performance. Teachers in schools with a head teacher or principal who qualifies for the reward will also be eligible for a financial reward
Level 5: Statutes; administrative decisions; the nature, quantity and the quality of industrial products; sectoral and societal performance	Increase pre-school enrolment rate – from 67% currently to 87% in 2020. Establishing monitoring committee – The National Committee on Pre-School Education and a Pre-School Division within the Ministry of Education to govern all pre-school providers. National Pre-school Curriculum Standard (NPCS) – Developed in collaboration with the private sector to standardise industry requirements. Quality improvement – training of pre-school teachers and teacher assistants, including 30,000 new and existing staff (2010-2012) Increasing number of classes (particularly for the 4+ age group).

Institutional level	Institutional reforms
	Developing a national pre-school information system – collation of administrative information. Ensure basic literacy and numeracy skills among children after 3 years of primary education literacy and numeracy programme (LINUS): screening conducted three times a year to assess effectiveness of programme and help identify students who require the LINUS remedial programme or Special Education Programme (subject to identified learning disabilities) New literacy and numeracy modules: simple learning concepts will be communicated followed by teaching of application of the concepts LINUS training: Approximately 17,000 teachers trained on the new LINUS modules for effective results by February 2010. Collaborative effort: awareness programmes and activities to pool resources of state and district education departments, Parent Teachers Associations (PTA), head teachers, teachers association and the public. Intensive monitoring: Bottom 10% schools will be monitored at state and district level Deployment of expert facilitators (FasiLinus): Sent to assist District Education Departments to support LINUS teachers in schools

Source: PEMANDU, (2012).

Table 58 Raising living standards of low-income households

Institutional level	Institutional reforms
Level 1: norms; rules; conventions; habits and values	Status quo. Improvement on definition of poor – standardised definition of variants of poverty focuses on marginal groups rather than race/religion.
Level 2: markets; states; corporate hierarchies; communities	Market intervention.
Level 3: Financial system; system of education; business system; systems of research	…
Level 4: Organisations	…
Level 5: Statutes; administrative decisions; the nature,	Standardised definition of variants of poverty: based on a monthly household income was implemented for use by all ministries and agencies to accelerate coordination to channel assistance.

Institutional level	Institutional reforms
quantity and the quality of industrial products; sectoral and societal performance	**e-Kasih** database – encourage low income households to register and be recorded by the government for immediate assistance and earning opportunities to be provided. **1AZAM**: a programme to lift low-income households out of poverty through means of employment, entrepreneurship, economic activities and services; **AZAM Tani (agriculture activities):** providing financial assistance-equipment, seeds, fertilisers and any other related items; training; marketing assistance and support from related agencies to ensure long term implementation, sustainability and success of agriculture activities; **AZAM Niaga (small businesses):** Elevating the living standards of the people by making them create their own income channels. Given the opportunity to venture into appropriate businesses to increase their income. Micro-credit, training, tools sourcing and motivational sessions will be provided to ensure the venture is viable and successful; **AZAM Kerja (job matching/job placement/income generating activities):** Linking available workforce to employers in need. Creating a database of human resource to match available jobs. A strategy called 'place and train' is used where the participants are given their job placement and then relevant training is provided for them in order to improve their skills. Furthermore, those interested in income generating activities are given the opportunity to select appropriate business options to supplement their monthly income. **AZAM Khidmat (services):** Assisting with various skill levels like landscaping, home management, day care centres, self-grooming and reflexology treatment to ensure there are diverse business options besides the availability of products, micro-credit, training, tools sourcing and motivational sessions will be provided to ensure the venture is viable.

Source: PEMANDU, (2012).

Table 59 Improving rural basic infrastructure

Institutional level	Institutional reforms
Level 1: Norms; rules; conventions; habits and values; ideology	Status quo.
Level 5: sectoral and societal performance	Build more than 7,000km of new and upgraded roads by 2012. The achievement of this will mean that 91.4% of the population 1,900km of the planned roads will be in Sabah and Sarawak Provide 50,000 new and restored houses to the rural and hard-core poor by 2012

Institutional level	Institutional reforms
	Speeding up delivery process through building of standard design houses Collaboration with suppliers to ensure that supply and availability of raw materials throughout the GTP is ensured Tracking and monitoring to ensure that the new and restored houses are delivered as per timeline Ensure access to clean and treated water Provided for 360,000 additional households by 2012. This will mean in Sabah and Sarawak, the percentage of rural houses with access to clean or treated water will reach approximately 60% in 2012 and 89% in 2012. Finding least cost and fast ways to deliver through usage of alternative sources like tube wells, gravity wells or rain water recovery for areas that are distant from reticulation networks Improved communications amongst government agencies, contractors and consultants speeded up construction works on site, thus creating effective and high intensity workforces throughout project periods. Provide access to 24 hour electricity 140,000 additional households to enjoy 24-hour electricity by 2012 By the end of 2012, 82% of households in Sabah and 73% of households in Sarawak will have access to electricity. Leverage on distributed power generation technologies like solar hybrid power generation or micro hydro-electricity for areas distant from electricity generation and transmission infrastructure.

Source: PEMANDU, (2012).

Table 60 Addressing cost of living

Institutional level	Institutional reforms
Level 1: Norms; rules; conventions; habits and values; ideology	Status quo.
Level 2: markets; states; corporate hierarchies; communities	Development of Kedai Rakyat 1Malaysia (KR1M) – approximately 250 KR1M labelled essential products can be bought 30-50% cheaper than normal stores/hypermarkets. Currently 5 stores in Klang Valley with another 22 to be opened by end 2011. Menu Rakyat 1Malaysia – RM2 for breakfast; RM4 for lunch; Currently there are 700 participating outlets and to be extended to 3000 outlets by end 2012. Commercial Agro Fund:

Institutional level	Institutional reforms
	Ensuring sufficient food supply, increasing the value-added of the agro-food sector, complementing and strengthening the supply chain RM1.1 billion has been allocated in 2012 for the development of the agriculture sector to fund key projects such as the Northern Terengganu Integrated Agricultural Development Project, Sabah and Sarawak Irrigation projects, TEKUN and NKEA projects; Expansion of the Commercial Agriculture Fund which will be given an allocation of RM300 million to include innovative agriculture projects; Contract farming programme in ensuring sufficient food supply. This programme will be handled by the Federal Agricultural Marketing Authority (FAMA), where agricultural produce will be marketed directly through FAMA to farmers' markets across the country A total of 4,500 'agro-entrepreneurs' are expected to be involved encompassing 7,000 hectares of land. For this, an allocation of RM14 million will be provided. Open 30 units of Agro Bazaar Kedai Rakyat to promote local agriculture products and promote 1Malaysia brand products
Level 3: Healthcare system	Klinik 1Malaysia – treatment for basic ailments is available for Malaysians at RM1 and RM15 for non-Malaysians. Clinics are opened in high density, low income areas to ensure that the Rakyat always have access to reliable and immediate medical attention. To have 50 clinics nationwide with approximately 3 – 4 clinics in each state.
Level 5: Statutes; administrative decisions; the nature, quantity and the quality of industrial products; sectoral and societal performance	Incentives/Cash assistance: Incentives for taxi drivers Cash assistance of RM500 for all households with income of RM3,000 and below; RM100 cash assistance for every school going child from Year 1 to Form 5 nationwide. Claiming of the assistance should be at the discretion of the parents who need the assistance; RM200 book voucher to all Malaysian students in public or private local institutions or higher learning, matriculation and Form 6 students nationwide 1Malaysia Rakyat's Welfare Programme (KAR1SMA): Assistance for poor Senior Citizens of RM300 per month Assistance for poor children of RM100, maximum RM450 per month per household; Assistance and allowance for disabled people between RM150 and RM300 per month.

Institutional level	Institutional reforms
	Special housing fund – aimed to assist fishermen due to their volatile income and with the aim of ensuring that they own their own homes.

Source: PEMANDU, (2012).

Table 61 Banking groups in Malaysia after consolidation

10 Anchor Banks	Merger Groups
Malayan Banking Bhd (MayBank)	Mayban Finance Bhd, Aseambankers Malaysia Bhd, PhileoAllied Bank Bhd, Pacific Bank Bhd, Sime Finance Bhd and Kewangan Bersatu Bhd
The Bumiputra – Commerce Bank Bhd	Bumiputra-Commerce Finance Bhd and Commerce International Merchant Bankers Bhd
RHB Bank Bhd	RHB Sakura Merchant Bankers Bhd, Delta Finance Bhd and Interfinance Bhd
Public Bank	Public Bank Bhd, Public Finance Bhd, Hock Hua Bank Bhd, Advance Finance Bhd and Sime Merchant Bankers Bhd
The Arab Malaysian Bank Bhd (AMMB)	Arab Malaysian Finance Bhd, Arab Malaysian Merchant Bank Bhd, Bank Utama Malaysia Bhd and Utama Merchant Bankers Bhd
Hong Leong Bank Bhd	Hong Leong Finance Bhd, Wah Tat Bank Bhd and Credit Corporation Malaysia Bhd
Perwira Affin Bank Bhd	Affin Finance Bhd, Perwira Affin Merchant Bankers Bhd, BSN Commercial Bank Bhd, BSN Finance Bhd and BSN Merchant Bank Bhd
Multi-Purpose Bank Bhd	International Bank Malaysia Bhd, Sabah Bank Berhad, MBf Finance Bhd, Bolton Finance Bhd, Sabah Finance Bhd, Bumiputra Merchant Bankers Bhd and Amanah Merchant Bank Bhd
EON Bank Bhd	EON Finance Bhd, Oriental Bank Bhd, City Finance Bhd, Perkasa Finance Bhd and Malaysian International Merchant Bankers Bhd
Southern Bank Bhd	Ban Hin Lee Bank Bhd, Cempaka Finance Bhd, United Merchant Finance Bhd, Perdana Finance Bhd and Perdana Merchant Bankers Bhd

Source: Muhamed-Zulkibri Abdul Majid et al., 2006

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